

VOLUME 29

PART I

*W. H. Camp.*  
*Botany Dept.*  
*Ohio State Univ.*

# NORTH AMERICAN FLORA

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## ERICALES

JOHN KUNKEL SMALL

## CLETHRACEAE

NATHANIEL LORD BRITTON

## LENNOACEAE, PYROLACEAE

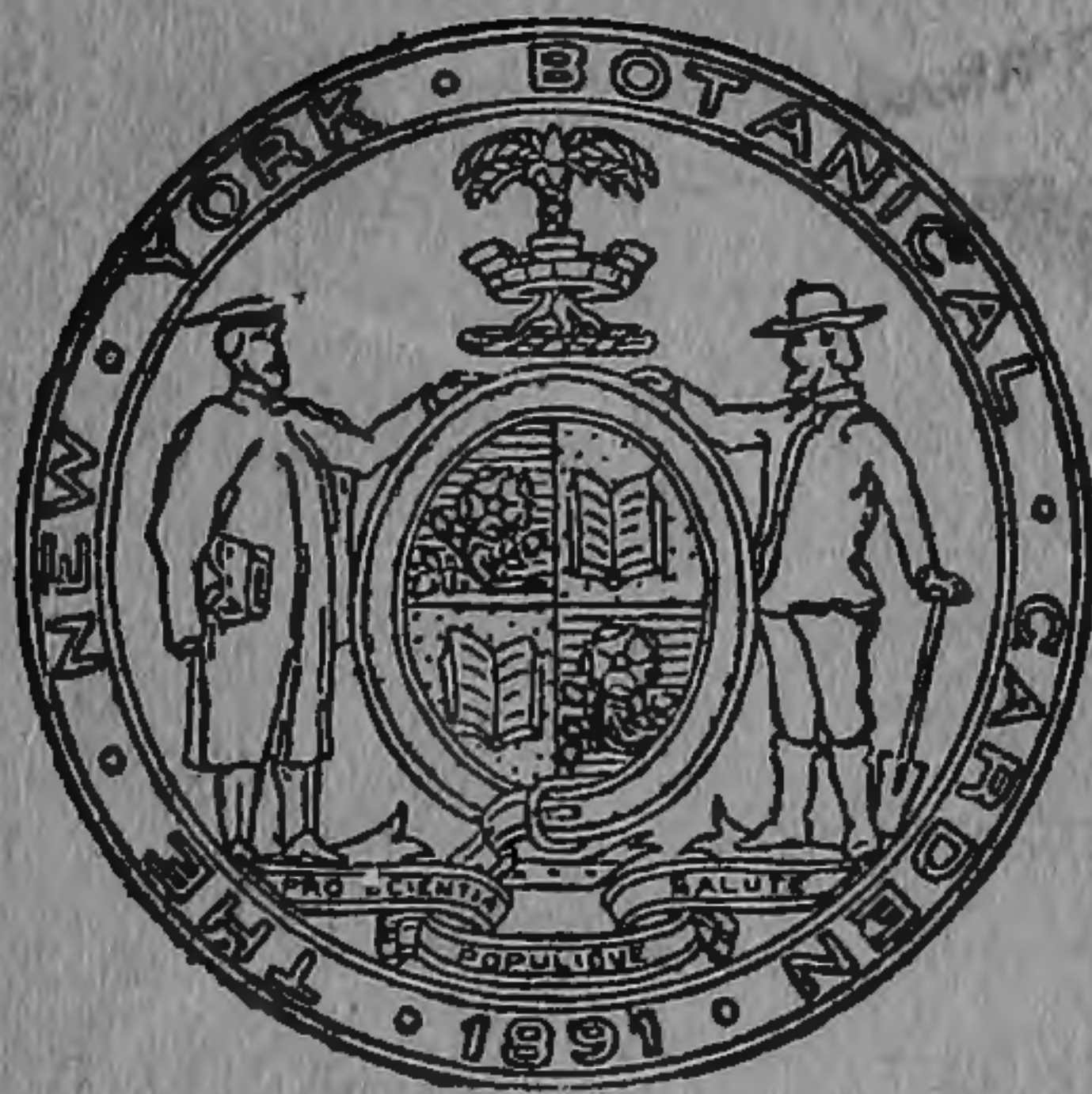
PER AXEL RYDBERG

## MONOTROPACEAE, ERICACEAE

JOHN KUNKEL SMALL

## UVA-URSI

LEROY ABRAMS



PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

AUGUST 31, 1914



## ANNOUNCEMENT

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The NORTH AMERICAN FLORA is designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

The work will be published in parts at irregular intervals, by the New York Botanical Garden, through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

Volume 1. Mycetozoa, Schizophyta, Diatomaceae.

Volumes 2 to 10. Fungi.

Volumes 11 to 13. Algae.

Volumes 14 and 15. Bryophyta.

Volume 16. Pteridophyta and Gymnospermae.

Volumes 17 to 19. Monocotyledones.

Volumes 20 to 32. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Dr. N. L. Britton, Dr. W. A. Merrill, and Dr. J. H. Barnhart.

Professor George F. Atkinson, of Cornell University; Professor John M. Coulter, of the University of Chicago; Mr. Frederick V. Coville, of the United States Department of Agriculture; Professor Edward L. Greene, of the United States National Museum; Professor Byron D. Halsted, of Rutgers College; and Professor William Trelease, of the University of Illinois, have consented to act as an advisory committee.

Each author will be wholly responsible for his own contributions, being restricted only by the general style adopted for the work, which must vary somewhat in the treatment of diverse groups.

The subscription price is fixed at \$1.50 for each part; it is expected that four or five parts will be required for each volume. A limited number of separate parts will be sold at \$2.00 each. Address:

THE NEW YORK BOTANICAL GARDEN

BRONX PARK

NEW YORK CITY

## Order ERICALES

BY JOHN KUNKEL SMALL

Herbs, undershrubs, shrubs, or trees, or colorless or variously colored, other than green, herbaceous root-parasites or humus-plants. Leaves alternate, deciduous or persistent and evergreen, represented by fleshy scales or with expanded blades, sometimes approximate or crowded, or rarely opposite or whorled, sometimes all basal, without stipules; blades simple, entire or toothed, pinnately veined. Flowers perfect, regular or nearly so, complete or rarely incomplete, symmetric or asymmetric, variously disposed, the inflorescence simple or compound, sometimes congested, or aggregated on the top of the disk-like expansion of the upper part of the stem. Calyx of 4–10 (or rarely fewer) distinct or partly united, imbricate or rarely valvate sepals, deciduous, or persistent, and unchanged at maturity, or accrescent. Corolla of 5–10 (or rarely fewer) distinct or partly united, imbricate or convolute petals, various in shape, or sometimes wanting. Androecium of as many or twice as many stamens as petals or corolla-lobes, or sepals or calyx-lobes, sometimes partly reduced to staminodia; filaments borne beneath the ovary or partly adnate to the corolla, or perigynous; anthers 2-celled, introrse, or rarely extrorse but introrsely inverted in anthesis (*Clethraceae* and *Pyrolaceae*), the sacs opening by terminal pores or chinks, or by longitudinal valves, often appendaged. Gynoecium of several, usually 2–7, united carpels; ovary 2–7-celled, the cavities sometimes with false partitions, or rarely 1-celled, superior or wholly or partly inferior; styles united except rarely near the tips, short or elongate, sometimes declined; stigmas minute or somewhat conspicuous, capitate, discoid, funnelform, or peltate, entire or lobed, often indusiate. Ovules anatropous, numerous, usually very numerous, rarely few or solitary. Fruit capsular, drupaceous, or baccate, exposed in the unchanged calyx or enclosed in the persistent corolla or more or less accrescent calyx. Embryo small or minute, in fleshy endosperm.

Stamens with free and distinct filaments.

Ovary superior; fruit exposed or enclosed in the calyx.

Gynoecium 3-carpellary; pollen-grains simple.

Gynoecium 4–7-carpellary, but the ovary rarely 1-celled; pollen-grains simple or compound.

Herbaceous root-parasites or saprophytes, with scale-like leaves; plants devoid of chlorophyl; pollen-grains simple.

Herbs, undershrubs, shrubs, or trees; plants with chlorophyl; pollen-grains compound.

Herbaceous or partly woody plants with rootstocks.

Shrubs or trees with erect or diffuse stems.

Ovary wholly or partly inferior.

Stamens with the filaments wholly or partly adnate to the corolla.

Herbaceous root-parasites or saprophytes, with scale-like leaves; plants without chlorophyl.

Herbs or partly woody plants, with green leaves.

Androecium without staminodia; caulescent plants.

Androecium with staminodia; acaulescent plants.

Fam. 1. CLETHRACEAE.

Fam. 2. MONOTROPACEAE.

Fam. 4. PYROLACEAE.

Fam. 5. ERICACEAE.

Fam. 6. VACCINIACEAE.

Fam. 3. LENNOACEAE.

Fam. 7. DIAPENSIACEAE.

Fam. 8. GALACACEAE.





## Family 1. CLETHRACEAE

BY NATHANIEL LORD BRITTON

Shrubs or trees. Leaves alternate, petioled, simple, often toothed, pinnately nerved. Flowers perfect, fragrant, in terminal, elongate, simple or branched racemes. Calyx deeply 5-cleft, its segments imbricate, persistent. Corolla white, rarely pink, of 5 essentially distinct, imbricate, deciduous petals, these usually broadest above the middle. Stamens 10; filaments slender, short or elongate. Anthers sagittate, inverted in anthesis, their sacs opening by apical pores. Pollen of simple grains. Disk obsolete. Ovary superior, pubescent, 3-celled, 3-lobed. Style 1, compound; stigma 3-lobed. Ovules numerous. Fruit a 3-lobed, loculicidally 3-valved capsule, the valves 2-cleft at maturity.

### 1. CLETHRA [Gron.] L. Sp. Pl. 396. 1753.

*Volkameria* P. Br. Hist. Jam. 214; hyponym. 1756.

*Tinus* L. Syst. Nat. ed. 10. 1010. 1759. Not *Tinus* (L.) Mill. 1754.

*Junia* Adans. Fam. Pl. 2: 165. 1763.

*Gillena* Adans. Fam. Pl. 2: 166. 1763.

*Kowalewskia* Turcz. Bull. Soc. Nat. Mosc. 32<sup>1</sup>: 263. 1859.

Characters of the family.

Type species, *Clethra alnifolia* L.

Style elongate, much longer than the calyx in fruit; filaments long; leaves deciduous. Species of the eastern United States. (EUCLETHRA.)

Leaves glabrous or nearly so; filaments glabrous.

Leaves pubescent, at least beneath.

Calyx-segments obtuse; style pubescent; capsule depressed.

Calyx-segments acute; style glabrous; capsule ovoid.

Style short, little longer than the calyx in fruit; filaments short; leaves persistent. Species of Mexico, Central America, and the West Indies. (GILLENA.)

Pedicels, or some of them, as long as the calyx or longer (sometimes shorter in *C. quercifolia* and *C. lanata*).

Leaves glabrous on both sides. (Mexico and Guatemala.)

Leaves tomentose, pubescent, or puberulent beneath.

Twigs and petioles long-villous; leaves green and villous beneath. (Costa Rica.)

Twigs and petioles tomentose, short-villous, or puberulent.

Pedicels slender, 8–12 mm. long. (Mexico.)

Pedicels shorter, 6 mm. long or less.

Calyx 2.5 mm. long, its segments lanceolate; leaves puberulent beneath. (Mexico.)

Calyx 3–4 mm. long, its segments ovate.

Leaves densely tomentose or puberulent and pale beneath.

Leaves, or some of them, sharply serrate. (Mexico.)

Lateral veins widely spreading.

Lateral veins ascending.

Leaves entire, merely undulate-dentate or low-serrate.

Leaves prevailingly oblong.

Racemes densely tomentose. (Jamaica.)

Racemes loosely tomentose. (Mexico.)

Leaves obovate. (Mexico and Central America.)

Leaves puberulent beneath.

Leaves tomentose beneath.

Leaves chartaceous; petioles slender; calyx 3–3.5 mm. long.

Leaves coriaceous; petioles stout; calyx 4–5 mm. long.

Leaves green, and pubescent only on the veins, beneath. (Jamaica.)

1. *C. alnifolia*.

2. *C. tomentosa*.

3. *C. acuminata*.

4. *C. suaveolens*.

5. *C. costaricensis*.

6. *C. Pringlei*.

7. *C. macrophylla*.

8. *C. quercifolia*.

9. *C. Rosei*.

10. *C. occidentalis*.

11. *C. Hartwegi*.

12. *C. hondurensis*.

13. *C. lanata*.

14. *C. mexicana*.

15. *C. jamaicensis*.

Pedicels shorter than the calyx.

Twigs and inflorescence densely long-villous. (Jamaica.)

16. *C. Alexandri*.

Twigs and inflorescence short-villous or tomentose.

Leaves green and nearly or quite glabrous beneath.

Leaves entire or nearly so. (Cuba.)

17. *C. cubensis*.

Leaves sharply dentate.

Flowers nodding. (Hidalgo.)

18. *C. Alcoceri*.

Flowers erect. (Jamaica.)

19. *C. bracteata*.

Leaves tomentose beneath.

Racemes divergent. (Durango.)

20. *C. Palmeri*.

Racemes erect or ascending. (Salvador.)

21. *C. salvadorensis*.

### 1. *Clethra alnifolia* L. Sp. Pl. 396. 1753.

*Clethra alnifolia denudata* Ait. Hort. Kew. 2: 73. 1789.

*Clethra paniculata* Ait. Hort. Kew. 2: 73. 1789.

*Clethra alnifolia glabella* Michx. Fl. Bor. Am. 1: 260. 1803.

*Clethra scabra* Pers. Syn. Pl. 1: 483. 1805.

*Clethra Michauxii* Courtois, Mag. Hort. Court. 1: 249. 1833.

*Clethra dentata* Ait.; DC. Prodr. 7: 588, as synonym. 1839.

*Clethra alnifolia Michauxii* Nichols. Kew Handl. Arb. 2: 67. 1896.

*Clethra alnifolia paniculata* Nichols. Kew Handl. Arb. 2: 67. 1896.

*Clethra alnifolia scabra* Nichols. Kew Handl. Arb. 2: 67. 1896.

*Clethra alnifolia* f. *rosea* Rehder, Mitt. Deuts. Dendr. Ges. 16: 75. 1907.

A shrub 1–3 m. tall, with erect or ascending branches and sparingly pubescent twigs. Leaves obovate or cuneate, 3–8 cm. long, usually acute or short-acuminate at the apex, sharply serrate, at least above the middle, glabrous or nearly so on both sides, short-petioled; racemes erect, canescent, 5–15 cm. long, simple or paniculately branched; pedicels 1–3 mm. long, erect or up-curved after flowering, subtended by narrow bracts; calyx-segments oblong or oblong-lanceolate, 2–2.5 mm. long, obtuse or sometimes acute, longitudinally ridged in age; corolla white, 8–9 mm. broad; petals oblong or cuneate-oblong, 5–6 mm. broad, hooded and often notched at the apex; filaments glabrous; style glabrous or pubescent; capsule subglobose, about 3 mm. in diameter, erect or ascending.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Maine to Pennsylvania, Florida, and Mississippi.

ILLUSTRATIONS: Pluk. Alm. pl. 115, f. 1; Catesby, Nat. Hist. Car. 1: pl. 66; Lam. Tab. Encyc. pl. 369; Gaertn. Fruct. pl. 63; Schkuhr, Handb. pl. 118; Goodale, Wild Fl. Am. pl. 22; Britt. & Brown, Ill. Fl. f. 2724; ed. 2. f. 3195.

### 2. *Clethra tomentosa* Lam. Encyc. 2: 46. 1786.

*Clethra alnifolia pubescens* Ait. Hort. Kew. 2: 73. 1789.

*Clethra alnifolia tomentosa* Michx. Fl. Bor. Am. 1: 260. 1803.

*Clethra incana* Pers. Syn. Pl. 1: 483. 1805.

*Clethra pubescens* Willd. Enum. 455. 1809.

A shrub 1–3 m. tall, with tomentose foliage, the branches erect or ascending. Leaves obovate, narrowly or broadly cuneate, 4–10 cm. long, acute or acuminate, serrate, more or less pubescent above, densely white-tomentose beneath, short-petioled; racemes solitary or several, 6–15 cm. long; pedicels 2–5 mm. long, shorter than the narrow subtending bracts, ascending in fruit; calyx-segments ovate or ovate-oblong, 3–3.5 mm. long, slightly ridged in age; petals white, spatulate or oblong-spatulate, 5–6 mm. long, concave above; filaments glabrous or nearly so; style pubescent; capsule depressed-globose, 4–4.5 mm. broad.

TYPE LOCALITY: Cultivated.

DISTRIBUTION: North Carolina to Florida and Alabama.

ILLUSTRATIONS: Bot. Mag. pl. 3743; Wats. Dendr. pl. 39.

### 3. *Clethra acuminata* Michx. Fl. Bor. Am. 1: 260. 1803.

*Clethra acuminata (glauca)* Pers. Syn. Pl. 1: 483. 1805.

*Clethra montana* Loisel. Nouv. Duham. 5: 130. 1811.

*Clethra glauca* Pers.; Steud. Nom. Bot. Phan. 1: 207, as synonym. 1821.

A shrub, or a small tree, with a maximum height of 6 m., the branches erect or rarely spreading. Leaves mostly crowded near the ends of branchlets, ovate to elliptic, 10–20 cm. long, acuminate at the apex, finely serrate except the cuneate or rounded base, deep-green above, paler and more or less pubescent, at least on the nerves, beneath, short-petioled; racemes 5–20 cm. long, usually solitary, densely pubescent; pedicels 3–8 mm. long; flowers secund;



calyx-segments ovate, 3.5–4 mm. long, acute, strongly ribbed; petals erect, cuneate, 6–7 mm. long, notched at the apex; filaments villous; style glabrous; capsule ovoid, 5 mm. long, drooping.

TYPE LOCALITY: High mountains of Carolina.

DISTRIBUTION: Mountains of Virginia and West Virginia to Tennessee, Georgia, and Alabama.

ILLUSTRATIONS: W. Bartón, Fl. N. Am. *pl.* 71; Bot. Cab. *pl.* 1427; Britton, N. Am. Trees *f.* 685; Britt. & Brown, Ill. Fl. *f.* 2725; ed. 2. *f.* 3196.

4. *Clethra suaveolens* Turcz. Bull. Soc. Nat. Mosc. 36<sup>2</sup>: 230. 1863.

Twigs rather slender, glabrous. Leaves oblong to lanceolate, subcoriaceous, 12 cm. long or less, 2–4 cm. wide, entire-margined, somewhat paler beneath than above, obtuse, acute or acuminate at the apex, narrowed or obtuse at the base, glabrous on both sides, the venation not very prominent, the petioles 12 mm. long or less; racemes 12 or fewer, tomentose, 9–16 cm. long; pedicels slender, 3–8 mm. long; calyx tomentulose, about 4 mm. long, its segments ovate-oblong, obtuse or acutish; petals entire or erose, about 5 mm. long; style 2–2.5 mm. long; ovary tomentulose.

TYPE LOCALITY: Chiapas, at 2100 meters altitude.

DISTRIBUTION: Chiapas to Santa Rosa and Alta Verapaz, Guatemala.

5. *Clethra costaricensis* Britton, sp. nov.

Twigs stout, densely villous with long brown hairs. Leaves obovate or elliptic-obovate, chartaceous, 10–17 cm. long, sparingly undulate-dentate or entire, 8 cm. wide or less, dark-green and loosely pubescent or becoming glabrous above, paler and densely villous beneath, obtuse or acutish at the apex, somewhat narrowed to the obtuse base, the stout, densely villous petioles 1.5–2.5 cm. long; racemes 4–6, densely brown-villous, 12–20 cm. long, the central one sometimes with 2 or 3 slender, divergent branches; pedicels 3–5 mm. long; calyx tomentose, 4 mm. long, its segments ovate-oblong, obtuse; petals obovate, erose, about one third longer than the calyx; style about 3 mm. long.

Type collected on the border of savannas of Cañas Gordas, Costa Rica, at 1100 m. altitude, February, 1897, *H. Pittier 11115* (herb. N. Y. Bot. Gard.).

6. *Clethra Pringlei* S. Wats. Proc. Am. Acad. 25: 157. 1890.

A tree, 8–13 m. high, the slender twigs densely and finely tomentose. Leaves oblanceolate to oblong or obovate, subcoriaceous, entire, or few-toothed above the middle, 4–11 cm. long, 2–6 cm. wide, acuminate to obtuse at the apex, narrowed or obtuse at the base, glabrous above, white-tomentulose beneath and brownish short-villous on the veins, the rather stout short-villous petioles 5–12 mm. long; racemes several, simple or branched, slender, finely white-tomentulose, 10–25 cm. long; pedicels slender, 6–10 mm. long; calyx-segments ovate, acute or acuminate, 3 mm. long; petals obovate, short-fimbriate; style about 2 mm. long; capsule tomentulose, bluntly 3-lobed, 3–4 mm. thick.

TYPE LOCALITY: Mountains east of San Luis Potosi, Mexico.

DISTRIBUTION: Mountain canyons, San Luis Potosi.

7. *Clethra macrophylla* Mart. & Gal. Bull. Acad.

Brux. 9<sup>1</sup>: 539. 1842.

A small tree, the twigs, petioles, racemes, and veins of the under leaf-surfaces finely brownish-tomentulose. Leaves subcoriaceous, obovate to oblong-elliptic, 2 dm. long or less, 2.5–8 cm. wide, minutely stellate-pubescent or becoming glabrous above, densely and finely white-tomentulose beneath, low-denticulate or subentire, acute or subacuminate at the apex, acute or obtuse and inequilateral at the base, the stout petioles 1–2.5 cm. long; racemes about 10, slender, 10–15 cm. long; pedicels about 2 mm. long; bracts linear-lanceolate, about as long as the pedicels; calyx tomentulose, 2.5–3 mm. long, its segments lanceolate to ovate-lanceolate, obtusish; style about 2.5 mm. long.

TYPE LOCALITY: Near Totutla and Mirador, Vera Cruz.

DISTRIBUTION: Mountains of Vera Cruz.

8. *Clethra quercifolia* Lindl. Bot. Reg. 28: *pl.* 23. 1842.

*Clethra oboata* H. & A. Bot. Beech. Voy. 302. 1837. Not *C. obovata* R. & P. 1834.

? *Kowalewskia serrulata* Turcz. Bull. Soc. Nat. Mosc. 32<sup>1</sup>: 264. 1859.

? *Clethra serrulata* Turcz. Bull. Soc. Nat. Mosc. 36<sup>2</sup>: 233. 1863.

A large shrub, with stout finely tomentulose twigs. Leaves coriaceous, obovate to elliptic, 6–16 cm. long, 4–10 cm. wide, strongly veined, the veins widely spreading, rather coarsely and sharply serrate, or some of them subentire, acute or obtuse at the apex, narrowed or obtuse at the base, loosely stellate-pubescent or becoming glabrous above, densely brownish-tomentulose beneath, the stout tomentulose petioles 1–3 cm. long; racemes 3–7, stout, tomentose, 10–17 cm. long; pedicels stout, tomentose, 1.5–4 mm. long; bracts linear, as long as the pedicels or longer; calyx tomentulose, 4–4.5 mm. long, its segments ovate, acutish or obtuse; petals obovate, denticulate and ciliate, somewhat longer than the calyx; ovary densely villous; style about 3 mm. long; stigma 3-lobed.

TYPE LOCALITY: Jalapa, Vera Cruz.

DISTRIBUTION: Vera Cruz, Morelos, and Federal District.

ILLUSTRATION: Bot. Reg. 28: *pl.* 23.

9. *Clethra Rosei* Britton, sp. nov.

Young twigs and petioles short-villous. Leaves oblong, chartaceous, 11 cm. long or less, 2.5–4 cm. wide, sharply serrate or some of them entire, acute or acutish at the apex, narrowed or subcuneate at the base, finely and loosely pubescent above, densely tomentose and pale beneath, the lateral veins ascending, the stout petioles 8–12 mm. long; racemes few, short-villous, 10–12 cm. long; pedicels rather slender, 3–5 mm. long; fruiting calyx about 3 mm. long, its segments ovate, acute, distinctly several-nerved; capsule finely pubescent, about 3 mm. broad; style 2 mm. long.

Type collected near Colomas, foothills of the Sierra Madre, Sinaloa, July 13–20, 1897, *J. N. Rose* 3226 (U. S. Nat. Herb.).

10. *Clethra occidentalis* (L.) Steud. (Nom. Bot. Phan. 207, as synonym. 1821.)

*Tinus occidentalis* L. Syst. Nat. ed. 10. 1010. 1759.

*Tinus Volkameria* Crantz, Inst. 2: 376. 1766.

*Clethra trifolia* Sw. Prodr. 74. 1788.

*Clethra tinifolia* Sw. Fl. Ind. Occ. 845. 1800.

A tree up to 18 m. high, or sometimes a shrub; the rather slender twigs brown-tomentose. Leaves oblong or elliptic to oblong-obovate, subcoriaceous, entire or sparingly low-denticulate, 2 dm. long or less, 3–9 cm. wide, glabrous, or nearly so, and dark-green above, densely white-tomentulose or gray-tomentulose, and brown-tomentulose on the veins, beneath, the tomentose petioles 6–20 mm. long; racemes several, 6–18 cm. long, tomentose; pedicels 2.5–6 mm. long; calyx 3–4 mm. long, tomentulose, its segments ovate or oblong-ovate, obtuse or obtusish; bracts linear, about as long as the pedicels or shorter; petals obovate, entire or nearly so, equaling or a little longer than the calyx; style about 2.5 mm. long; capsule depressed-globose, bluntly 3-lobed, densely pubescent, about 3.5 mm. in diameter.

TYPE LOCALITY: Jamaica [Sixteen-mile Walk].

DISTRIBUTION: Jamaica; recorded from Mexico, probably erroneously.

ILLUSTRATIONS: Sloane, Hist. Jam. *pl.* 198, *f.* 2; P. Br. Hist. Jam. *pl.* 21, *f.* 1.

11. *Clethra Hartwegi* Britton, sp. nov.

Twigs rather stout, tomentose when young. Leaves oblong to obovate-oblong, coriaceous, entire or somewhat undulate-dentate, 10–12 cm. long, 3.5–5 cm. wide, obtuse or acutish at the apex, narrowed or obtuse at the base, finely pubescent above, at least on the veins, or becoming glabrous, densely tomentulose beneath and brownish-tomentose on the veins, the tomentose petioles stout, 1.5 cm. long; racemes few, loosely brown-tomentose, 8–12 cm. long; pedicels 3–5 mm. long; calyx about 4 mm. long, tomentulose, its segments oblong-ovate, obtuse; petals slightly longer than the calyx, denticulate; style about 2.5 mm. long.

Type collected in the cold region near Bolaños, Colotlan, Jalisco, *Hartweg* 341 (herb. N. Y. Bot. Gard.).



12. *Clethra hondurensis* Britton, sp. nov.

Leaves firm-chartaceous in texture, narrowly obovate, irregularly low-dentate, about 15 cm. long, 6–7 cm. wide, dark-green and glabrous or nearly so above, densely whitish-tomentulose and prominently veined beneath; racemes several or numerous, tomentulose, slender, 15–23 cm. long; pedicels 3–6 mm. long; calyx about 4 mm. long, tomentulose, its segments ovate, acute; petals obovate, erose-ciliolate, about as long as the calyx; style 2.5 mm. long.

Type collected at San Pedro Sula, Department of Santa Barbara, Honduras, *C. Thieme* 5336 (herb. Columbia Univ.).

13. *Clethra lanata* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 538. 1842.

Young twigs and petioles densely brown-tomentose. Leaves obovate, firm-chartaceous, 6–10 cm. long, 5 cm. wide or less, entire or sparingly dentate, rounded or acute at the apex, narrowed or cuneate at the base, glabrous or very nearly so above when old, densely brownish-tomentulose beneath, especially on the veins, the lateral veins ascending, the slender petioles 8–15 mm. long; racemes 5–9, densely flowered, 10–16 cm. long, the rachis and pedicels tomentose; pedicels 1.5–3.5 mm. long; calyx 3–3.5 mm. long, its segments ovate, acutish or obtuse; petals obovate, short-fimbriate, somewhat longer than the calyx; style about 2 mm. long; capsule puberulent, 4 mm. wide.

TYPE LOCALITY: Temperate regions of Oaxaca.

DISTRIBUTION: Oaxaca to Guatemala and Panama.

14. *Clethra mexicana* DC. Prodr. 7: 590. 1839.

*Clethra integrifolia* Moc.; DC. Prodr. 7: 590, as synonym. 1839.

*Clethra ovalifolia* Moc.; DC. Prodr. 7: 590, as synonym. 1839.

*Kowalewskia integerrima* Turcz. Bull. Soc. Nat. Mosc. 32<sup>1</sup>: 264. 1859. (According to Hemsley.)

*Clethra Kowalewskii* Turcz. Bull. Soc. Nat. Mosc. 36<sup>2</sup>: 233. 1863.

Young twigs, petioles, and rachis brown-tomentose. Leaves obovate, coriaceous, 6–12 cm. long, 4–6.5 cm. wide, finely pubescent above, even when old, densely brownish-tomentose, especially on the veins, beneath, entire or sparingly low-dentate, rounded at the apex, narrowed to the base, the lateral veins rather widely spreading, the stout petioles 1–2 cm. long; racemes 3–5, 8–20 cm. long, the rachis stout; pedicels 3–7 cm. long; calyx 4–5 mm. long, tomentulose, its segments ovate-oblong, obtuse or acutish; petals obovate, erose, a little longer than the calyx; style about 3 mm. long; capsule tomentose, about 4 mm. broad.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Jalisco and Sinaloa.

15. *Clethra jamaicensis* Britton, sp. nov.

Twigs, petioles, and inflorescence brown-tomentose or villous. Leaves elliptic, thin in texture, acute or short-acuminate, sharply serrate above the middle, 10–18 cm. long, 8 cm. wide or less, dark-green and glabrous or nearly so above, villous on the veins and light-green beneath, the villous petioles 1–1.7 cm. long; racemes about 6, slender, 23 cm. long or less; pedicels 3–7 mm. long; bracts subulate, as long as the pedicels or shorter; calyx tomentulose, 4–4.5 cm. long, its segments ovate; petals obovate, about as long as the calyx; style shorter than the petals; ovary villous.

Type collected in woods near Port Antonio, Jamaica, July 7, 1897, *A. Fredholm* 3135 (herb. N. Y. Bot. Gard.).

16. *Clethra Alexandri* Griseb. Fl. Brit. W. Ind. 142. 1859.

An irregularly branched shrub, about 2 m. high, the very stout twigs densely brown-villous. Leaves clustered near the ends of the twigs, elliptic to obovate, coriaceous, 12 cm. long or less, 2–6 cm. wide, acute or obtusish at the apex, mostly obtuse at the base, serrate with low gland-tipped teeth, or rarely subentire, villous on the upper side when young but becoming glabrous and dark-green, permanently villous-tomentose, reticulate-veined, and pale beneath, the veins prominent, the stout villous petioles 6–16 mm. long; racemes often as many as 10, villous-tomentose, 2.5 dm. long or less; bracts linear-lanceolate, densely villous, longer



than the flowering pedicels; pedicels stout, as long as the calyx or shorter; calyx-segments villous, oblong, 4–5 mm. long; petals white, obovate, a little longer than the sepals, nearly entire; style about 3 mm. long; capsule densely villous, 4–5 mm. thick.

TYPE LOCALITY: Summits of the Blue Mountains, Jamaica.

DISTRIBUTION: Known only from the type locality.

17. *Clethra cubensis* A. Rich. in Sagra, Hist. Cuba 11: 75. 1850.

*Clethra byrsonimoides* Griseb. Mem. Am. Acad. II. 8: 170. 1860.

A shrub 1.5–2.5 m. high, the twigs densely brown-villous. Leaves subcoriaceous, elliptic to obovate, 10 cm. long or less, 2–5 cm. wide, obtuse, apiculate or acute at the apex, obtuse or acutish at the base, low-serrate with gland-tipped teeth or subentire, glabrous above, pubescent on the veins beneath, finely reticulate-veined on both sides, the stout villous petioles 2 cm. long or less; racemes several, clustered at the ends of the twigs, densely brown-villous, 7–10 cm. long; pedicels villous, 2–4 mm. long; bracts linear-lanceolate, villous, about as long as the pedicels; calyx-segments oblong, obtuse, tomentose, 2.5–3 mm. long; petals obovate, obtuse, white, entire or erose, a little longer than the sepals; style very short; capsule depressed, sunken at the top, 5 mm. broad, finely tomentose.

TYPE LOCALITY: Mt. Mogote, 1380 meters altitude, province of Santiago de Cuba, Cuba.

DISTRIBUTION: Mountains of Oriente, Cuba.

18. *Clethra Alcocerii* Greenm. Proc. Am. Acad. 41: 240. 1905.

A small tree, with densely brown-tomentulose twigs. Leaves elliptic-lanceolate to oblong-obovate, subcoriaceous, 14 cm. long or less, 2–6 cm. wide, obtuse, mucronate, or short-acuminate at the apex, narrowed but obtuse at the base, low-dentate or denticulate with gland-tipped teeth, dark-green, minutely stellate-pubescent or becoming glabrate above, paler, finely stellate-pubescent and sparingly brown-pubescent on the prominent veins beneath, the stout brown-pubescent petioles about 1 cm. long; racemes several, densely tomentose-pubescent, 1–2 dm. long; pedicels only 1–3 mm. long; flowers nodding; calyx about 3 mm. long, its segments ovate, obtuse, densely tomentulose; petals obovate, obtuse, subfimbriate; ovary densely pubescent; filaments glabrous.

TYPE LOCALITY: Barranca near Trinidad Iron Works, Hidalgo.

DISTRIBUTION: Known only from the type locality.

19. *Clethra bracteata* Griseb. Fl. Brit. W. Ind. 141. 1859.

A shrub, the twigs and inflorescence densely brown-tomentose or villous. Leaves elliptic to oblong-obovate, firm in texture, acute, denticulate, 6–10 cm. long, glabrous above, sparingly pubescent beneath, the tomentose petioles 2 cm. long or less; racemes several, about 10 cm. long, simple or branched; bracts subulate, about equaling the flowers or shorter; pedicels 1–3 mm. long; calyx-segments ovate-oblong, 3–3.5 mm. long; petals ciliolate, slightly exceeding the sepals; style shorter than the petals.

TYPE LOCALITY: Summits of the Blue Mountains, Jamaica.

DISTRIBUTION: Blue Mountains, Jamaica.

20. *Clethra Palmeri* Britton, sp. nov.

Young twigs, petioles, and racemes densely brown-tomentose. Leaves elliptic to ovate-elliptic or elliptic-obovate, subcoriaceous, 7–12 cm. long, 3.5–6 cm. wide, rounded, obtuse, or acutish at the apex, obtuse at the base, entire or some of them sharply serrate, bright-green and glabrous or nearly so above, densely pale-tomentose beneath, the lateral veins rather widely spreading, 10 or 11 on each side of the midvein, the stout petioles 8–15 mm. long; racemes about 5, narrow, densely flowered, 15 cm. long or less; pedicels very short, stout, 1–2 mm. long; calyx tomentulose, 3.5–4 mm. long, its segments ovate to ovate-oblong, obtuse or acutish; petals obovate, erose, about 5 mm. long; style about 3 mm. long.

Type collected at San Ramon, Durango, April–May, 1906, *E. Palmer 137* (herb. N. Y. Bot. Gard.).



21. *Clethra salvadorensis* Britton, sp. nov.

Young twigs, inflorescence, and under surfaces of the leaves densely short-tomentose. Leaves obovate or oblong-obovate, subcoriaceous, 10–15 cm. long, 3.5–5 cm. wide, sparingly pubescent above, obtuse at the apex, narrowed at the base, the tomentose petioles 1–1.5 cm. long; racemes about 6, densely flowered, 6–10 cm. long; flowering pedicels 1–2 mm. long; calyx about 3 mm. long, its broadly ovate segments tomentulose, obtuse; petals broadly obovate, rounded, ciliate; style about 2 mm. long; capsule tomentulose, about 4 mm. broad.

Type collected at southern foot of the volcano Izalco, at 1000 m. altitude, Salvador, February 25, 1907, *H. Pittier 1983* (U. S. Nat. Herb.).







## Family 2. MONOTROPACEAE

By JOHN KUNKEL SMALL

Saprophytic or root-parasitic herbs destitute of green coloring matter, usually brown, purple, yellow, red, or pink, or white, mostly succulent. Stems solitary or clustered from matted roots, often scape-like, typically simple. Leaves reduced to short scales or rarely elongate. Flowers perfect, or nearly so, erect or nodding. Calyx of 2–6 distinct, often deciduous sepals. Corolla white or colored, of 3–6 distinct or partly united petals, or wanting in *Allotropa*. Androecium of 6–12 hypogynous stamens, or sometimes borne on a small glandular disk. Filaments slender or partly dilated, unappendaged. Anthers 2-celled or with confluent sacs, opening by valves or pores, sometimes appendaged. Pollen-grains simple. Gynoecium superior, mostly of 4–6 united carpels, short. Ovary mostly 4–6-celled, or 1-celled, usually ovoid, globular, or depressed, sometimes ribbed or lobed, sessile. Styles united, usually columnar, often stout. Stigma discoid or funnelform, or somewhat capitate, often slightly lobed. Ovules numerous. Fruit a 4–6-celled capsule, or sometimes 1-celled, often somewhat fleshy, commonly surrounded by the marcescent perianth, loculicidal. Seeds numerous, minute.

Ovary; and capsule, 4–6-celled, with a central column.

Corolla wanting; anthers extrorse in bud, introrse in anthesis.

1. ALLOTROPA.

Corolla present; anthers not reversed.

Petals distinct.

Flower solitary; anthers opening by 2 equal chinks.

2. MONOTROPA.

Flowers several; anthers opening by a continuous line into 2 very unequal valves.

3. HYPOPHYTIS.

Petals partly united.

Anther-sacs appendaged; corolla of an urceolate type.

4. PTEROSPORA.

Anther-sacs unappendaged; corolla of a campanulate type.

Flower without a disk; anthers narrowly oblong or oblong-lanceolate.

5. SARCODES.

Flower with a lobed disk; anthers globular or didymous.

6. MONOTROPSIS.

Ovary, and capsule, 1-celled, without a central column.

Petals distinct.

Sepals and petals entire; anthers as wide as long.

7. PITYOPUS.

Sepals and petals laciniate-fimbriate; anthers elongate.

8. PLEURICOSPORA.

Petals partly united.

9. NEWBERRYA.

### 1. ALLOTROPA T. & G.; A. Gray, Proc. Am. Acad. 7: 368. 1868.

Whitish or red-tinged herbs with glabrous foliage. Stem simple. Leaves scale-like, elongate, rather numerous, usually crowded on the lower part of the stem. Flowers numerous, borne in an elongate, spike-like, erect raceme. Sepals 5, broad, distinct. Corolla wanting. Stamens 10, somewhat exserted; filaments slender; anthers short, lobed, unappendaged, extrorse in the bud, introrse in anthesis, the sacs opening to near the middle by a chink. Ovary short, often globose; style short and stout, slightly elongate in age; stigma peltate-capitate. Capsule depressed, seated in the calyx. Seeds very numerous, linear.

Type species, *Allotropa virgata* T. & G.

### 1. *Allotropa virgata* T. & G.; A. Gray, Proc. Am. Acad. 7: 368. 1868.

Stem stoutish, 1–5 dm. tall, glabrous, often decidedly thickened at the base; leaves thick, the blades ovate to ovate-lanceolate at the base of the stem to lanceolate or linear-lanceolate

above, mostly 1–2.5 cm. long; raceme fully one half the length of the stem or less, the bracts similar to the upper leaves but narrower; flowers crowded together, or sometimes separated, particularly in age; sepals whitish, orbicular-ovate to rhombic-ovate, 4–6 cm. long, erose; filaments slender, glabrous; anthers about 2 mm. in diameter; capsules spheroidal, 4–5 mm. broad.

TYPE LOCALITY: Cascade Mountains, Washington.  
DISTRIBUTION: British Columbia to California.

## 2. *MONOTROPA* L. Sp. Pl. 387. 1753.

White, pale-pink, or red wax-like herbs with glabrous foliage. Stem simple. Leaves scale-like, approximate or crowded on the lower part of the stem, remote and larger above. Flower solitary, nodding in anthesis, becoming erect. Sepals 2–4, not dilated upward, glabrous or nearly so. Petals 5 or 6, dilated upward, ciliate, somewhat saccate at the base. Stamens 10 or 12, included; filaments slender, pubescent; anthers short, transverse, the sacs opening by 2 equal chinks. Ovary 5–6-celled, shallowly grooved, slightly elongate; style short and thick; stigma disk-like. Capsule of an ovoid or spheroidal type.

Type species, *Monotropa uniflora* L.

Petals pubescent within, ciliate; filaments pubescent; capsule ovoid or oblong-ovoid.

Petals glabrous; filaments glabrous; capsule spheroidal.

1. *M. uniflora*.
2. *M. coccinea*.

### 1. *Monotropa uniflora* L. Sp. Pl. 387. 1753.

*Monotropa Morrisoniana* Michx. Fl. Bor. Am. 1: 266. 1803.

*Monotropa Morrisoni* Pers. Syn. Pl. 1: 469. 1805.

Plants 0.5–3 dm. tall, white or pink, or rarely deep-red, becoming black in age or in drying, the stems often clustered; leaves erect, the blades suborbicular or ovate on the lower part of the stem to oblong or lanceolate, mostly 1 cm. long or less, the upper ones relatively longer than the lower; flower campanulate; sepals spatulate, oblong-spatulate, or oblong, mostly 15–18 mm. long, erose near the apex or erose-toothed, glabrous; petals spatulate, or dilated above the middle, longer than the sepals, pubescent within, ciliate below the middle; ovary ovoid, fluted; style much shorter than the ovary; filaments pubescent; capsule ovoid to oblong-ovoid, 1–1.5 cm. long.

TYPE LOCALITY: Maryland.

DISTRIBUTION: Newfoundland to Washington, Florida, and California.

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 362; Hook. Exot. Fl. pl. 85; W. Barton, Fl. N. Am. pl. 86, f. 1; Torr. Fl. N. Y. pl. 71; Britt. & Brown, Ill. Fl. f. 2739; ed. 2. f. 3210; Meehan's Mo. 12: pl. 9; Mathews, Field Book 327.

### 2. *Monotropa coccinea* Zucc. Flora 15<sup>2</sup>: Beibl. 100. 1832.

*Monotropa coccinea mexicana* Lange, Vidensk. Meddel. 1867: 119. 1868.

*Monotropa coccinea nicaraguensis* Lange, Vidensk. Meddel. 1867: 119. 1868.

Plants mostly 1–2 dm. tall, red, becoming black in age or in drying, the stems usually clustered; leaves lax or spreading, the blades ovate-lanceolate or lanceolate on the lower part of the stem, lanceolate or narrowly lanceolate to linear above, mostly 0.5–1 cm. long, the upper ones much longer than the lower; flower urceolate or campanulate; sepals oblong to linear-oblong, mostly 12–14 mm. long, erose above the middle; petals obovate to spatulate, about as long as the sepals, glabrous and eciliate; ovary globose or spheroidal; style much shorter than the ovary; filaments glabrous; capsule spheroidal.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Mexico, Central America, and Colombia; reported from Jamaica.

ILLUSTRATION: Vidensk. Meddel. 1867: pl. 2.

## 3. *HYPOPITYS* Hill, Brit. Herb. 221. 1756.

Yellow, tawny, pink, or red, or rarely white herbs, with more or less pubescent foliage. Stem simple. Leaves scale-like, approximate or crowded near the base of the stem, the upper ones separated, and usually larger than the lower. Flowers in a terminal raceme which is usually nodding before or in anthesis. Sepals 5, at least in the early flowers, 3 or 4 in the



later ones, narrowed at the base. Petals as many as the sepals, but longer and broader, saccate, and often also auricled at the base, often pubescent. Stamens 10, or 6 or 8, included; filaments slender, often pubescent; anthers short, often reniform, sometimes apiculate, opening by a continuous line into 2 very unequal valves. Ovary 4- or 5-celled, or sometimes 3-celled, globose to ovoid, lobed; style short or elongate, columnar; stigma disk-like or funnel-form, obscurely lobed. Capsule ovoid to oblong, erect or spreading.

Type species, *Monotropa Hypopitys* L.

Bracts and sepals ciliate or eciliate.

Flowers small; petals less than 1 cm. long in anthesis; plants slender.

Style columnar; stigma discoid.

Stigma not retrorsely bearded; style sparingly pubescent; sepals and petals with short cilia.

Stigma retrorsely bearded; style copiously pubescent; sepals and petals with long cilia.

Style much dilated upward; stigma funnelform.

Flowers large; petals more than 1 cm. long in anthesis; plants stout.

Bracts and sepals fimbriate.

1. *H. americana*.

2. *H. lanuginosa*.

3. *H. brevis*.

4. *H. latisquama*.

5. *H. fimbriata*.

### 1. *Hypopitys americana* (DC.) Small, Fl. SE. U. S. 880. 1903.

*Hypopitys multiflora americana* DC. Prodr. 7: 780. 1839.

Plants lemon-yellow, or sometimes pink, the stem finely pubescent or nearly glabrous, 1-3 dm. tall, rather slender; leaves mostly 1 cm. long or less, the blades ovate or ovate-lanceolate at the base of the stem, narrowly ovate, lanceolate, or rhombic above; bracts shorter than the flowers; sepals mostly 6-8 mm. long in anthesis, spatulate to rhombic-spatulate or oblanceolate, short-ciliate; petals cuneate to oblong-cuneate, finely and sparingly pubescent, short-ciliate; filaments 6-8 mm. long; capsules mostly globose to spheroidal, 5-9 mm. long, usually short-pedicelled.

TYPE LOCALITY: Canada.

DISTRIBUTION: Ontario and New York, and southward, especially in and near the mountains, to North Carolina.

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2. f. 3211.

### 2. *Hypopitys lanuginosa* (Michx.) Nutt. Gen. 1: 271. 1818.

*Monotropa lanuginosa* Michx. Fl. Bor. Am. 1: 266. 1803.

Plants deep-pink or crimson, or rarely pale, the stem pubescent, usually copiously so, 0.5-3.5 dm. tall, rather slender; leaves mostly less than 1 cm. long, the blades suborbicular or ovate near the base of the stem, ovate, oval, or oblong above; bracts as long as the flowers or shorter; sepals 6-7.5 mm. long in anthesis, cuneate, spatulate, or narrowly elliptic-spatulate, long-ciliate; petals cuneate to almost oblong, pubescent, often densely so, long-ciliate; filaments 7-8 mm. long; capsules mostly oval to oblong, 4-6 mm. long, usually pedicelled.

TYPE LOCALITY: North Carolina.

DISTRIBUTION: Newfoundland, Nova Scotia, and Quebec, and southward to Florida and Louisiana.

ILLUSTRATIONS: Torr. Fl. N. Y. pl. 72; Britt. & Brown, Ill. Fl. ed. 2. f. 3212.

### 3. *Hypopitys brevis* Small, sp. nov.

Plants apparently tawny, the stem finely pubescent, about 1 dm. tall, rather slender; leaves ovate, often broadly so, the blades of the upper ones less than 1 cm. long, the lower ones smaller than the upper; inflorescence congested, the bracts mostly shorter than the flowers; sepals oblong-cuneate, 5-7 mm. long, ciliate; petals cuneate, pubescent, ciliate; filaments 4-5 mm. long; stigma funnelform; capsules not seen.

Type collected in Independence Valley, Cascade Mountains, Oregon, August, 1892, *Moses Craig* 5214, in part (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Washington and Oregon.

### 4. *Hypopitys latisquama* Rydb. Bull. Torrey Club 40: 461. 1913.

*Hypopitys lutea* Howell, Fl. NW. Am. 1: 429. 1901. Not *H. lutea* S. F. Gray, 1821.

Plants yellowish, pink, or coral-red, the stem usually pubescent, sometimes only slightly so, 1-4 dm. tall, rather stout; leaves thick, the blades mostly ovate, usually broadly so, or

orbicular-ovate, the upper ones 1–1.5 cm. long, undulate or erose, the lower ones smaller; bracts shorter than the flowers; sepals mostly 9–11 mm. long, spatulate to cuneate, ciliate; petals cuneate to obovate, pubescent, ciliate; filaments 7–8 mm. long; capsules globose to ovoid-globose, 5.5–7 mm. long.

TYPE LOCALITY: Bridger Mountains, Montana.

DISTRIBUTION: Montana and British Columbia to California, New Mexico, and Mexico.

#### 5. *Hypopitys fimbriata* A. Gray, Proc. Am. Acad. 8: 394. 1872.

Plants red or yellowish, the stem 3 dm. tall or less, glabrous or pubescent with very short hairs; leaves various, the blades of the lower ones broadly ovate or orbicular-ovate, more or less erose, the upper ovate or oblong-ovate, mostly 1–1.5 cm. long, erose-fimbriate; bracts commonly as long as the flowers or longer, fimbriate; sepals 10–11 mm. long, acute or acuminate, fimbriate above the claw-like base, ciliate; petals exceeding the sepals, cuneate and sometimes dilated at the tip, pubescent, erose and ciliate; filaments 6–7 mm. long; style dilated upward; stigma funnelform; capsules ovoid, 5–6 mm. long.

TYPE LOCALITY: Oregon.

DISTRIBUTION: Oregon.

#### 4. *PTEROSPORA* Nutt. Gen. 1: 269. 1818.

Chestnut-colored or purplish-brown herbs with pubescent foliage. Stem simple. Leaves scale-like, elongate, mostly near the base of the stem, and there sometimes crowded. Flowers numerous, borne in elongate open racemes, nodding. Calyx of 5 slightly united sepals, the lobes relatively narrow. Corolla urceolate, marcescent, exceeding the calyx, the short lobes recurved. Stamens 10, included; filaments slender; anthers short, each sac with a deflexed awn, opening lengthwise. Ovary 5-celled, depressed; style stout; stigma peltate-capitate, slightly 5-lobed. Capsule much depressed, 5-lobed. Seeds very numerous, broadly winged at the apex.

Type species, *Pterospora andromedea* Nutt.

##### 1. *Pterospora andromedea* Nutt. Gen. 1: 269. 1818.

*Monotropa procera* Torr.; Eaton, Man. ed. 2. 324. 1818.

Stem stout, 3–11 dm. tall, viscid-pubescent, arising from an enlarged underground base; leaves thick, the blades lanceolate to linear-lanceolate, approximate or crowded near the base of the stem, remote above, mostly 1–3.5 cm. long; raceme becoming virgate, erect, the bracts very narrow, often as long as the pedicels or longer; flowers not crowded; calyx 9–10 mm. broad, the lobes linear to lanceolate, glandular-pubescent; corolla white, 7–8 mm. long, the lobes ovate to reniform, very short and recurved; filaments subulate; anthers about 1 mm. long, the awns as long as the sacs or longer; capsules spheroidal, 8–12 mm. broad.

TYPE LOCALITY: Near Niagara Falls, Canada.

DISTRIBUTION: Prince Edward Island to Quebec and British Columbia, and southward to Pennsylvania, California, and northern Mexico.

ILLUSTRATIONS: Raf. Med. Fl. pl. 78; Lindl. Collect. pl. 5; E. & P. Nat. Pfl. 4: f. 6; Britt. & Brown, Ill. Fl. f. 2737; ed. 2. f. 3208; M. E. Parsons, Wild Fl. Calif. 187.

#### 5. *SARCODES* Torr. Pl. Frém. 17. 1853.

? *Pterosporopsis* Kellogg, Pacific. 9 Je 1854.—Curran, Bull. Calif. Acad. 1: 141. 1885.

Red, usually bright-red herbs, with pubescent foliage. Stem simple. Leaves scale-like, broad and imbricate near the base of the stem, elongate and separated above. Flowers in stout, short racemes, spreading or nodding, the bracts narrow, mostly exceeding the flowers. Calyx of 5 slightly united sepals, persistent, the lobes relatively narrow. Corolla campanulate, or cylindraceous-campanulate, usually exceeding the calyx, marcescent, the lobes broad, shorter than the tube, erect or slightly spreading. Stamens 10, included; filaments narrow, glabrous; anthers elongate, unappendaged, opening at the apex. Ovary slightly depressed, 5-celled, 5-lobed; style columnar; stigma depressed-capitate, slightly 5-lobed. Capsule spheroidal, fleshy.

Type species, *Sarcodes sanguinea* Torr.



1. *Sarcodes sanguinea* Torr. Pl. Frém. 18. 1853.

? *Pterosporopsis sonoraënsis* Kellogg, Pacific. 9 Je 1854.—Curran, Bull. Calif. Acad. 1: 141. 1885.

Stem stout, 1–5 dm. tall, viscid-pubescent, somewhat thickened at the base; leaves thick, the blades ovate and mostly 2–8 cm. long at the base of the stem, lanceolate and linear and elongate above, all glandular-ciliate; raceme very thick, several- to many-flowered, mostly less than one half the length of the stem, the bracts similar to the upper leaves, but narrower, crowded or approximate; calyx-lobes linear, linear-oblong, or oblong-lanceolate, 11–15 mm. long, sometimes somewhat accrescent, glandular-pubescent; corolla 1–1.5 cm. long, glabrous, the lobes rounded, undulate; filaments subulate; anthers linear-oblong, 3–4 mm. long; capsules spheroidal, 9–21 mm. broad.

TYPE LOCALITY: Valley of the Sacramento, probably on the Yuba River.

DISTRIBUTION: Coniferous woods, Oregon, California, and western Nevada.

ILLUSTRATIONS: Torr. Pl. Frém. *pl.* 10; Chatin. Anat. *pl.* 55; M. E. Parsons, Wild Fl. Calif. 363.

6. *MONOTROPSIS* Schw.; Ell. Bot. S. C. & Ga. 1: 478. 1817.

*Schweinitzia* Ell.; Nutt. Gen. Add. 3. 1818.

Purplish or brownish herbs, with glabrous foliage. Stem simple. Leaves scale-like, mostly scattered, those at the base of the stem approximate and broad, those on the upper part of the stem remote. Flowers in a dense terminal spike or raceme which is nodding at least at the tip. Sepals 5, somewhat shorter than the corolla, or longer, persistent. Corolla campanulate, persistent, the 5 lobes shorter than the tube or longer, the tube 5-saccate at the base. Stamens 10, included; filaments slender; anthers short, didymous, the sacs unappendaged, opening by terminal pores. Ovary short, usually ovoid, 5-celled; style short and stout; stigma disk-like, slightly lobed. Capsule of an ovoid type, included in the persistent perianth.

Type species, *Monotropis odorata* Ell.

Corolla in anthesis about as long as the calyx or shorter, colored.

Corolla-lobes much shorter than the tube: calyx and corolla about equal in length.

Corolla-lobes about as long as the tube: calyx about twice as long as the corolla.

Corolla in anthesis about twice as long as the calyx, white.

1. *M. odorata*.

2. *M. Lehmaniae*.

3. *M. Reynoldsiae*.

1. *Monotropis odorata* Ell. Bot. S. C. & Ga. 1: 479. 1817.

*Schweinitzia odorata* Raf. Am. Mo. Mag. 3: 99. 1818.

*Schweinitzia caroliniana* G. Don, Gen. Hist. 3: 867. 1834.

Plants 5–11 cm. tall, the stems usually clustered, purple or purplish-brown; leaves mostly 3–8 mm. long, the blades deltoid-ovate to ovate, obtuse or acute; flowers violet-scented; sepals oblong to oblong-lanceolate, 8–12 mm. long, mostly acute or acutish, membranous in age; corolla pink, about equal to the calyx in length, the lobes ovate, much shorter than the tube.

TYPE LOCALITY: Stokes County, North Carolina.

DISTRIBUTION: Maryland to Kentucky, Georgia, and Alabama.

ILLUSTRATIONS: Mem. Am. Acad. II. 3: *pl.* 2; Britt. & Brown, Ill. Fl. f. 2738; ed. 2. f. 3209; Lounsberry, S. Wild Fl. *pl.* 118.

2. *Monotropis Lehmaniae* Burnham, Torreyia 6: 235. 1906.

Plants 4–10 cm. tall, the stems mainly brownish-purple; leaves mostly 2–6 mm. long, the blades ovate, often very broadly so at the base of the stem, obtuse or acute; flowers not fragrant; sepals narrowly oblong to linear-oblong or oblong-lanceolate, 7–8 mm. long, or slightly broadened upward, mostly obtuse or obtusish, membranous in age; corolla mainly pink, much shorter than the calyx, the lobes as long as the tube or nearly so.

TYPE LOCALITY: Roaring Gap, Blue Ridge, North Carolina.

DISTRIBUTION: Western North Carolina.

### 3. *Monotropis Reynoldsiae* (A. Gray) A. Heller, Cat. N. Am.

Pl. 5. 1898.

*Schweinitzia Reynoldsiae* A. Gray, Proc. Am. Acad. 20: 301. 1885.

Plants more slender than the two preceding species, 4–13 cm. tall, the stems often clustered, purple; leaves mostly 2–6 mm. long, the blades ovate or ovate-lanceolate, acute or short-acuminate; flowers more or less fragrant; sepals ovate or ovate-lanceolate or rarely linear, 2–4 mm. long, mostly acutish, often erose near the apex, membranous in age; corolla white, much longer than the calyx, the lobes ovate, much shorter than the tube.

TYPE LOCALITY: Near St. Augustine, Florida.

DISTRIBUTION: Eastern Florida and the Indian River region.

### 7. *PITYOPUS* Small, gen. nov.

White or pale herbs with glabrous or nearly glabrous foliage. Stem simple, sometimes clustered. Leaves scale-like, approximate, or crowded on the lower part of the stem, the upper ones narrower than the lower. Flowers in a dense spike or spike-like erect raceme, erect or ascending, the bracts relatively narrow, mostly shorter than the flowers. Sepals 4 or 5, distinct, persistent. Petals 4 or 5, distinct, rather narrow, about as long as the sepals, pubescent within. Stamens 8 or 10, included; filaments slender, pubescent; anthers short and stout, usually as wide as long, much wider than the slender filament, each sac opening by a short slit on the side. Ovary ovoid, 1-celled, 4–5-lobed, each lobe 2-ribbed; style stout, as long as the ovary or shorter, pubescent. Stigma depressed, somewhat annular. Capsule 1-celled.

Type species, *Pityopus oregona* Small.

#### 1. *Pityopus oregona* Small, sp. nov.

? *Monotropa californica* Eastw. Bull. Torrey Club 29: 75. 1902.\*

Plant white, the stem glabrous, fully 1 dm. tall or less, stoutish; leaves 2 cm. long or less, the blades deltoid to triangular-lanceolate or lanceolate on the upper part of the stem, entire or erose; bracts shorter than the flowers, similar to the upper leaves, or the upper ones spatulate; sepals about 12 mm. long, in anthesis, rhombic-oblongate to linear; petals oblong-obovate, about as long as the sepals or slightly longer, pubescent within; filaments 6–7 mm. long; capsules not seen.

Type collected in a dense forest north of Mount Hood, Oregon, July 3, 1891, *Thomas Howell* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Oregon (and California?).

### 8. *PLEURICOSPORA* A. Gray, Proc. Am. Acad. 7: 369. 1868.

Whitish or pale-brown herbs with glabrous or nearly glabrous foliage. Stem simple. Leaves scale-like, scattered, the upper ones slightly narrower than the lower. Flowers in a dense short spike or spike-like raceme, erect or ascending, the bracts broad, sometimes exceeding the flowers in anthesis. Sepals 4 or 5, distinct, persistent, relatively narrow. Petals 4 or 5, persistent, sometimes shorter than the sepals. Stamens 8 or 10, included; filaments slender, glabrous; anthers narrow, erect on the apex of the slightly narrower filament, the sacs opening lengthwise. Ovary oval or ovoid, 1-celled, not lobed; style short and stout; stigma depressed-capitate. Capsule 1-celled.

Type species, *Pleuricospora fimbriolata* A. Gray.

Petals oblong, elliptic, oval, or oblong-lanceolate.

Perianth-parts relatively narrow; sepals ovate or oval; petals elliptic to oblong-lanceolate, mostly acute.

Perianth-parts relatively broad; sepals lanceolate to linear-lanceolate; petals oblong or oval, mostly obtuse.

Petals spatulate to oblong-spatulate.

1. *P. fimbriolata*.

2. *P. densa*.

3. *P. longipetala*.

\* The plate (Bull. Torrey Club 29: pl. 7) with the original description of *Monotropa californica* indicates that the specimens, now lost, from Marin County, California, on which *M. californica* was based, and the plants from Mount Hood, Oregon, are very closely related, if not identical. The only evidence lacking is the internal structure of the ovary of the Californian plant.



1. *Pleuricospora fimbriolata* A. Gray, Proc. Am. Acad. 7: 369. 1868.

Stem stout, mostly 1–2.5 dm. tall, glabrous or nearly so; leaves thick, the blades ovate or ovate-lanceolate on the lower part of the stem, lanceolate above, the lower ones erose or undulate, the upper with scarious fimbriate margins, all mostly acute or acuminate, mostly 1–2 cm. long; spike, or raceme, erect, rather loosely flowered, the flowers erect or nearly so, the bracts similar to the upper leaves; sepals lanceolate to linear-lanceolate, 8–9 mm. long in anthesis, erose-fimbriate, mostly acuminate, often caudate-tipped; petals narrowly elliptic or oblong-lanceolate; capsules oblong-ovoid.

TYPE LOCALITY: Mariposa Grove, California.

DISTRIBUTION: Washington to California.

2. *Pleuricospora densa* Small, sp. nov.

Stem stout, usually less than 1.5 dm. tall, glabrous or with scattered hairs; leaves thick, the blades orbicular, broadly ovate or deltoid on the lower part of the stem, ovate to lanceolate above, all more or less erose, obtuse or acute, 1–2.5 cm. long, or smaller at the base of the stem; spike, or raceme, densely flowered, erect, the flowers often spreading, the bracts nearly or quite similar to the upper leaves; sepals ovate or oval, 5–7 mm. long in anthesis, erose-fimbriate, obtuse; petals oblong or oval, or slightly broader above or below the middle; capsules globose-ovoid.

Type collected in high pine woods (2100 meters), canon above Martis Valley, Placer County, California, August 1896, C. F. Sonne (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Eastern California.

3. *Pleuricospora longipetala* Howell, Fl. N. W. Am. 1: 429. 1901.

Stem rather slender or sometimes stout, 1–1.5 dm. tall, glabrous; leaves thickish, the blades lanceolate, or ovate-lanceolate at the base of the stem, acute or acuminate, lacinate-toothed, the edges often somewhat scarious, mostly 1–2 cm. long; spike, or raceme, rather closely flowered, the flowers nearly erect, the bracts similar to the upper leaves; sepals oblong-lanceolate or lanceolate, 7–9 mm. long in anthesis, erose-toothed or fimbriate, acute or slightly acuminate; petals narrowly spatulate to almost oblong-spatulate, much longer than the sepals; capsules ovoid.

TYPE LOCALITY: Near the hot springs, Clackamas County, Oregon.

DISTRIBUTION: Oregon.

9. *NEWBERRYA* Torr. Ann. Lyc. N. Y. 8: 55. 1864.

*Hemitomes* A. Gray, in Newb. Pacif. R. R. Rep. 6<sup>3</sup>: 80. 1858. Not *Hemitomus* L'Her. 1804.

Brown or paler, stout or stoutish herbs. Stem simple. Leaves scale-like, approximate or crowded, or slightly scattered in age, those at the base of the stem the broadest. Flowers in a dense terminal spike or a corymbiform glomerule, erect or ascending, the bracts broad, often shorter than the flowers. Sepals 2, or sometimes 4, persistent, bract-like, narrow, often very narrow. Corolla urceolate to campanulate, pubescent within, with 4–6 broad ascending or spreading lobes as long as the tube or shorter. Stamens 8–10, mostly included; filaments slender, pubescent with long hairs; anthers oblong, erect on the apex of the much narrower filament, the sacs opening lengthwise. Ovary ovoid, or nearly so, 1-celled, with 4 or 5 two-lobed placentae; style pubescent; stigma depressed-capitate. Capsule 1-celled, short, usually ovoid.

Type species, *Hemitomes congestum* A. Gray.

Corolla-lobes about one third or one half as long as the tube.

Inflorescence a corymbiform glomerule; anthers narrowly oblong, the sacs opening close to the connective.

Inflorescence a compact spike; anthers broadly oblong, the sacs opening remote from the connective.

Corolla-lobes about as long as the tube or longer.

Corolla pinkish, the lobes ovate; central flower 6-merous.

Corolla white, the lobes oblong; central flower 5-merous.

Sepals 4, the outer ones linear-lanceolate; corolla-lobes about as long as the tube.

Sepals 2, oblong-spatulate; corolla-lobes longer than the tube.

1. *N. congesta*.

2. *N. spicata*.

3. *N. pumila*.

4. *N. subterranea*.

5. *N. longiloba*.

1. *Newberrya congesta* (A. Gray) Torr.; A. Gray,  
Bot. Calif. 1: 464. 1876.

*Hemitomes congestum* A. Gray, in Newb. Pacif. R. R. Rep. 6<sup>3</sup>: 81. 1858.

Plants with a stem 1.5 dm. tall or less, terminated by a corymbiform glomerule; scales ovate, the lower ones broadly so, the upper ones narrower, all obtuse, irregularly erose; sepals 2, linear or nearly so, entire or nearly so; corolla urceolate, the lobes ovate, about one third as long as the tube; anthers narrowly oblong, the sacs opening near the connective.

TYPE LOCALITY: Upper Des Chutes Valley, Oregon.

DISTRIBUTION: Oregon and northern California.

ILLUSTRATIONS: Pacif. R. R. Rep. 6<sup>3</sup>: *pl.* 12; Bull. Torrey Club 20: *pl.* 142.

2. *Newberrya spicata* A. Gray, Proc. Am. Acad. 15: 44. 1879.

*Hemitomes spicatum* A. Heller, Cat. N. Am. Pl. 5. 1898.

Plants with a stem mostly less than 1 dm. tall, terminated by a compact spike; scales oblong, or the lower ones spatulate-oblong, sometimes acutish, erose-fimbriate; sepals 2, spatulate, erose-fimbriate; corolla oblong-campanulate, the lobes oblong-ovate, about one half as long as the tube; anthers broadly oblong, the sacs opening remote from the connective.

TYPE LOCALITY: Humboldt County, California.

DISTRIBUTION: Washington to northern California.

3. *Newberrya pumila* (Greene) Small.

*Hemitomes pumilum* Greene, Erythea 2: 121. 1894.

Plants cushion-like, with a stem 0.5 dm. tall or less, at least in anthesis; scales closely imbricate, the lower deltoid-ovate, the upper ones lanceolate, all acute; inflorescence congested, a terminal corymbiform glomerule which together with the rest of the plant forms a structure resembling a thistle-head, the middle-flower 6-merous, the others 4-merous; sepals 4, linear, ciliate; corolla pale-pink, the lobes ovate, about as long as the tube.

TYPE LOCALITY: Mendocino County, California.

DISTRIBUTION: Known only from the type locality.

No specimens of this species and the following one have been seen; these descriptions are compiled from the original ones.

4. *Newberrya subterranea* Eastw. Proc. Calif.  
Acad. III. 1: 80. 1897.

*Hemitomes subterraneum* A. Heller, Cat. N. Am. Pl. 5. 1898.

Plants subterranean (always?), with the stem bulbous at the base; scales imbricate, broadly ovate or orbicular, or narrower above, the upper ones oblong-lanceolate and acuminate; inflorescence congested, a terminal corymbiform glomerule, the middle flower 5-merous, the others 4-merous; sepals 4, the 2 outer linear-lanceolate, brown, about equaling the corolla, the 2 inner white, variable in length; corolla white, the lobes oblong, about as long as the tube.

TYPE LOCALITY: Willow Creek Cañon, California.

DISTRIBUTION: Known only from the type locality.

5. *Newberrya longiloba* Small, sp. nov.

Plants not subterranean, with relatively slender stems mostly less than 1 dm. tall; scales imbricate, ovate to oblong, the lower ones obtuse or acute, the upper acute or slightly acuminate, all, especially the upper ones, erose; inflorescence congested, a terminal corymbiform glomerule, the middle flower 5-merous, the others 4- or 5-merous; sepals 2, oblong-spatulate, shorter than the corolla; corolla white, 11–13 mm. long, the lobes oblong, longer than the tube.

Type collected in woods, Skamania County, Washington, August 19, 1892, *Suksdorf 2168* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Known only from the type locality.



### Family 3. LENNOACEAE

BY PER AXEL RYDBERG

Parasitic herbs, wholly lacking chlorophyl. Stem fleshy. Leaves reduced to short scales. Flowers perfect, cymosely paniculate, spicate, or inserted on a peltate disk. Sepals 5–10, linear, distinct or nearly so. Corolla gamopetalous, tubular or narrowly funnelform or salverform, 5–8-lobed. Stamens 5–10, alternate with the corolla lobes; filaments adnate to the corolla nearly throughout; anthers 2-celled, introrse, dehiscent by longitudinal slits. Gynoecium of 6–14 wholly united carpels; ovary by dorsal false partitions divided into twice as many cells with one ovule in each; style simple; stigma subcapitate or peltate, crenate. Ovules anatropous, nearly horizontal. Fruit drupaceous-capsular, at last irregularly circumscissile; stones 12–28, 1-seeded. Seeds with endosperm; embryo globular, without distinction between caulicle and cotyledons.

Stamens 8, in 2 series; anther-sacs divergent below; corolla more or less salver-shaped; flowers cymose-thyrsoïd.

Stamens in a single series; anther-sacs parallel; corolla tubular or funnelform; flowers not cymose-thyrsoïd.

Flowers spicate; corolla narrowly funnelform with ascending lobes; sepals shorter than the corolla, puberulent.

Flowers on a peltate disk; corolla tubular with erect lobes; sepals longer than the corolla, plumose.

1. LENNOA.

2. PHOLISMA.

3. AMMOBROMA.

#### 1. LENNOA Lex.; Llave & Lex. Nov. Veg. Descr. 1: 7. 1824.

*Corallophyllum* H.B.K. Nov. Gen. & Sp. 7: 275. 1825.

Succulent parasitic plants. Stem simple, or branched either at the base or above, covered with more or less toothed scales. Inflorescence cymose-thyrsoïd; flowers subtended by bracts. Sepals 5–8, distinct to near the base, pubescent or puberulent, linear. Corolla more or less salver-shaped; limb plicate, with 8 emarginate lobes; tube ventricose at the base and splitting open over the enlarging fruit. Stamens 8, in two series; filaments linear, adnate to the corolla for most of their length; anthers 2-celled, the sacs elliptic, coherent at the apex, divergent below, dehiscent longitudinally. Ovary of 8 carpels, by false partitions 16-celled; ovules horizontal, anatropous. Fruit more or less drupaceous, with about 16 stones.

Type species, *Lennoa madreporoides* Lex.

Corolla 4–6 mm. long; limb ascending, 2.5–3 mm. broad; plant often branched at the base.

1. *L. caerulea*.

Corolla 6–8 mm. long; limb reflexed in fruit, 4–6 mm. broad; plant simple below, branched above.

2. *L. madreporoides*.

#### 1. *Lennoa caerulea* (H.B.K.) Fourn. Bull. Soc. Bot. Fr. 16: 11. 1869.

*Corallophyllum caeruleum* H.B.K. Nov. Gen. & Sp. 7: 276. 1825.

A succulent yellowish plant; stem 5–10 cm. high, often branched at the base; scales lanceolate, glandular-puberulent; bracts oblong, acute, membranous; flowers sessile, scarcely longer than the bracts; sepals colored, linear, longer than the corolla, pulverulent-hirtellous; corolla pale-violet, 4–6 mm. long; limb 2.5–3 mm. broad, with 8 emarginate lobes.

TYPE LOCALITY: Near the city of Mexico.

DISTRIBUTION: Parasitic on composites; Mexico, Puebla, and Morelos.

ILLUSTRATIONS: H.B.K. Nov. Gen. & Sp. *pl.* 660 *bis*; Abh. Nat. Ges. Halle 11: *pl.* 2, *f.* 1, 5, 6, 8–11; *pl.* 3, *f.* 1, 2, 13; E. & P. Nat. Pfl. 4<sup>1</sup>: *f.* 7, G.

#### 2. *Lennoa madreporoides* Lex.; Llave & Lex. Nov. Veg.

Descr. 1: 7. 1824.

*Lennoa madreporoides* Steud. Nom. Bot. ed. 2. 2: 22. 1841.

A succulent yellowish or brownish plant; stem 5–15 cm. high, usually simple up to the inflorescence; scales elliptic or lanceolate, dentate, acute; flowers sessile, longer than the linear

bracts; sepals linear, hispidulous-puberulent, shorter than the corolla; corolla 6–8 mm. long, light-violet with a yellowish throat; limb 4–6 mm. broad, reflexed in fruit, sinuately 8-lobed with emarginate lobes.

TYPE LOCALITY: Valladolid, Morelos.

DISTRIBUTION: San Luis Potosi to Sinaloa and Oaxaca.

ILLUSTRATIONS: Abh. Nat. Ges. Halle 11: *pl.* 2, *f.* 2–4, 7, 12–19; *pl.* 3, *f.* 8; E. & P. Nat. Pfl. 4<sup>1</sup>: *f.* 7, *H*, *J* (as *L. caerulea*).

## 2. PHOLISMA Nutt.; Hook. Ic. *pl.* 626. 1844.

Succulent parasitic herbs. Flowers perfect, spicate, ebracteate. Sepals 5 or 6, linear or slightly clavate, puberulent. Corolla narrowly funnelform, nearly regular, with 5 or 6 rounded, plicately imbricate lobes. Stamens 6, rarely 5, adnate to above the middle of the tube of the corolla; anthers oblong-ovate, obtuse, the sacs parallel, dehiscent longitudinally. Ovary subglobose, 6–10-carpellary, by false partitions 12–20-celled; stigma 6–10-lobed.

Type species, *Pholisma arenarium* Nutt.

### 1. *Pholisma arenarium* Nutt.; Hook. Ic. *pl.* 626. 1844.

*Lennoa arenaria* Fourn. Bull. Soc. Bot. Fr. 16: 11. 1869.

*Pholisma depressum* Greene, Bull. Calif. Acad. 1: 198. 1885.

A brownish fleshy plant; stem above ground 1–2 dm. high; scales erect, small, oblong; spike 3–8 cm. long, 2–3 cm. thick; sepals linear or somewhat clavate, glandular-puberulent, shorter than the corolla; corolla purple, 6–8 mm. long, narrowly funnelform; limb 3.5–4.5 mm. broad; lobes semiorbicular, sinuate.

TYPE LOCALITY: Given as "Monterey and St. Diego," but the type was collected at the latter place.

DISTRIBUTION: In sand, parasitic on the roots of *Eriodictyon*, *Clematis*, *Hymenoclea*, and *Chrysothamnus* and other shrubby composites; southern California, Lower California, and the island of Socorro.

ILLUSTRATION: Hook. Ic. *pl.* 626.

## 3. AMMOBROMA Torr.; A. Gray, Mem. Am.

Acad. II. 5: 327. 1854.

Succulent parasitic plants. Stem simple, scaly, mostly buried in the sand, at the summit expanded into a peltate, shallowly cyathiform disk bearing the ebracteate flowers. Sepals 6–10, distinct to the base, linear-filiform, plumose, as long as the corolla. Corolla tubular or nearly so, mostly with 6 erect, plicate, emarginate lobes. Stamens 6–10 (mostly 8); filaments adnate to the corolla to near their upper end; anthers 2-celled, the sacs parallel, opening longitudinally. Ovary of 6–10 carpels, by false partitions 12–20-celled; style elongate, stout; stigma subcapitate, crenate on the margins. Ovules hemitropous, becoming anatropous. Fruit globose, more or less drupaceous; endocarp chartaceous, separating readily from the fleshy exocarp; stones 12–20, more often the latter number.

Type species, *Ammobroma Sonorae* Torr.

### 1. *Ammobroma Sonorae* Torr.; A. Gray, Mem. Am.

Acad. II. 5: 327. 1854.

An orange-colored fleshy plant; stem 2–6 dm. high, 1.5–2.5 cm. thick, gradually tapering upwards; scales numerous, lanceolate, appressed, except under the inflorescence; inflorescence 3–5 cm. wide, with recurved margins; flowers of the depressed center with longer pedicels, those of the rim subsessile, making the whole inflorescence externally flat-topped; corolla about 8 mm. long, purple, plicate at the summit.

TYPE LOCALITY: Near the head of the Gulf of California, on hills around Adair Bay, Sonora.

DISTRIBUTION: Parasitic, apparently on species of *Prosopis*, and on *Franseria dumosa* and *Parosela Emoryi*; northwestern Sonora, southwestern Arizona, and southeastern California.

ILLUSTRATIONS: Ann. Lyc. N. Y. 8: *pl.* 1; Abh. Nat. Ges. Halle 9: *pl.* 1; *pl.* 3, *f.* 3–7, 9–12, 16; E. & P. Nat. Pfl. 4<sup>1</sup>: *f.* 7, *A–F*.



## Family 4. PYROLACEAE

By PER AXEL RYDBERG

Perennial plants with creeping scaly rootstocks. Stem above ground short, sometimes more or less suffruticose, but of short duration, producing a short internode and a cluster or false verticil of leaves each year. Leaves alternate but closely approximate, petioled, evergreen, mostly coriaceous, usually serrate or crenate, without stipules. Inflorescence racemose, corymbose, or subumbellate; peduncles with 1–5 scales. Flowers bracteate, perfect. Calyx of 5 sepals, only slightly if at all united. Corolla regular or nearly so, quincuncial in estivation, of 5 distinct petals, white, greenish-white, pink, or purplish, hypogynous. Stamens 10, hypogynous; filaments often more or less dilated at the base; anthers 2-celled, deeply furrowed between the sacs, usually attached at or near the middle, usually produced at the proximal end into two tubes, opening at the end by round or oblong pores, after anthesis reflexed so that the pores become distal. Gynoecium of 5 united carpels; ovary subglobose, 5-celled and obtusely 5-angled; cells many-ovuled; styles wholly united, short or elongate; stigma with 5 papillae or 5-rayed. Capsule umbilicate, obtusely 5-angled, 5-celled, loculicidal. Seed very numerous; aril large, reticulate; albumen fleshy.

Capsule dehiscent from below upwards, the edges of the valves connected by cobwebby threads; petals concave and more or less converging; flowers racemose.

Style strongly deflexed at the base, then curved upwards; stigmas much narrower than the thickened truncate end of the style, which forms a collar, with 5 erect or connivent papillae; filaments declined and curved up, bearing the anthers above the style.

Style straight, without a collar; stigma peltate, broader than the style; papillae marginal, spreading; stamens all equally connivent around the pistil.

Hypogynous disk none; petals without nectaries; leaves crenulate; style in our species short.

Hypogynous disk present, 10-lobed; petals each with 2 tubercle-like nectaries; leaves serrate; style elongate.

Capsule dehiscent from above downward, without cobwebby threads; petals spreading; stigma peltate, broader than the style.

Subacaulescent herbs; flowers solitary; stigma with 5 (rarely 4) large marginal papillae; leaf-blades thin, suborbicular.

Suffruticose plants; flowers corymbose or subumbellate; stigma merely 5-rayed and 5-crenate, without papillae; leaf-blades ovate, lanceolate, or oblanceolate, coriaceous.

1. PYROLA.

2. ERXLEBENIA.

3. RAMISCHIA.

4. MONESES.

5. CHIMAPHILA.

### 1. PYROLA (Tourn.) L. Sp. Pl. 396. 1753.

*Thelaia* Alef. *Linnaea* 28: 33. 1856.

Perennial herbs with rootstocks. Stems above ground short, usually bearing a cluster of leaves. Scape usually with 1 or more scales, similar to the bracts of the inflorescence. Leaves mostly petioled, evergreen, rather thick, veiny, the veins either stopping in the sinuses of the teeth, or prolonged into a mucro. Inflorescence racemose. Flowers mostly nodding, short-pedicelled. Sepals 5, slightly united. Corolla campanulate or hemispheric; petals 5, distinct, usually elliptic to orbicular, white, greenish, or purplish. Stamens 10; filaments subulate, usually more or less dilated at the base, incurved; anthers oblong, dehiscent by pores at the ends of more or less developed tubes. Pistil of 5 united carpels; ovary with 5 rounded angles, destitute of glands; style deflexed at the base, then curved upwards and usually gradu-

ally thickened towards the apex, which is dilated into a collar; stigma of 5 erect papillae. Fruit depressed-globose, umbilicate, 5-valved, dehiscent from the base upwards, the valves connected by arachnoid threads.

Type species, *Pyrola rotundifolia* L.

Petals acute at the apex.

Petals obtuse or rounded at the apex.

Sepals much longer than broad, at least about half longer.

Petals pink, rose, or purple.

Leaf-blades shorter than the petioles.

Sepals lanceolate or deltoid-lanceolate, twice as long as broad, tapering from the very base; leaf-blades distinctly denticulate by the excurrent veins.

Sepals ovate-lanceolate to ovate, about one and a half times as long as broad, broadest just above the base; leaf-blades crenulate.

Leaf-blades elliptic or obovate to suborbicular, usually acutish at the base.

Leaf-blades round-reniform to suborbicular, usually subcordate at the base.

Leaf-blades longer than the petioles.

Petals white or greenish.

Sepals lanceolate or lance-deltoid, acute or acuminate, entire.

Leaf-blades decidedly tapering at the base, usually acute at the apex.

Scape 2–3 dm. high; petals rounded-obovate; style scarcely exerted.

Scape 1–2 dm. high; petals oval; style distinctly exerted.

Leaf-blades rounded, subcordate or abruptly contracted at the base, mostly rounded at the apex (except in *P. Gormanii*).

Scape 2–3 dm. high; bracts and sepals pale, the former shorter than the pedicels; petals not strongly veined; leaf-blades abruptly contracted but acute at the base.

Scape 1–2 dm. high; bracts and sepals rose-colored, the former equaling the pedicels; leaf-blades mostly rounded or subcordate at the base.

Leaf-blades mostly rounded at the apex, crenulate or subentire.

Leaf-blades acute, mucronate-denticulate, with excurrent veins.

Sepals elliptic, usually rounded or obtuse at the apex, crenulate.

Tubes of the anthers short and curved; filaments decidedly dilated below and style distinctly thickened upwards.

Tubes of the anthers obsolete and straight; filaments and style filiform or nearly so.

Sepals little if at all longer than broad; petals mostly greenish-white.

Basal leaves several; scape with 0–3 scales below the inflorescence.

Leaf-blades rounded at the apex, oval to orbicular; margin not chartaceous.

Leaf-blades suborbicular, 1–3 cm. long, usually shorter than the petioles.

Leaf-blades oval, 3–8 cm. long, longer than the petioles.

Leaf-blades usually acute at the apex; if obtuse, the blades spatulate; margin chartaceous.

Leaf-blades ovate to oval, usually broadest below the middle, more or less mottled.

Leaf-blades obovate, oblanceolate or spatulate, not mottled.

Basal leaves 1 or 2, reduced and short-petioled, or none; scape with several scales.

Plant stout, many-flowered; petals broadly obovate, greenish-brown on the back; leaf-blades, if present, lanceolate.

Plant slender, few-flowered; petals elliptic, obovate, greenish-white; leaf-blades, if present, orbicular to elliptic.

1. *P. oxypetala*.

2. *P. bracteata*.

3. *P. uliginosa*.

4. *P. asarifolia*.

5. *P. Sartorii*.

6. *P. angustifolia*.

14. *P. septentrionalis*.

7. *P. americana*.

8. *P. borealis*.

9. *P. Gormanii*.

10. *P. grandiflora*.

11. *P. occidentalis*.

12. *P. chlorantha*.

13. *P. elliptica*.

15. *P. picta*.

16. *P. dentata*.

17. *P. aphylla*.

18. *P. sparsifolia*.

# 1. *Pyrola oxypetala* Aust.; A. Gray, Man. ed. 5. 302. 1867.

Perennial with a slender rootstock; stem above ground very short; petioles 1–3 cm. long; leaf-blades ovate, 1–2.5 cm. long, acute at each end, subentire; scape with 1 or 2 subulate scales, including the inflorescence about 2 dm. high; raceme 8–10-flowered; bracts subulate, shorter than the pedicels, 5 mm. long; sepals deltoid, 1.5 mm. long, acute, longer than broad; petals white, ovate, acute, about 5 mm. long; filaments dilated below; anthers oblong, mucronate at the distal end, not inverted; tubes short, somewhat curved; style only slightly curved, thickened upwards.

TYPE LOCALITY: Wooded hillside near Deposit, Delaware County, New York.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Bull. Torrey Club 20: *pl.* 158; Britt. & Brown, Ill. Fl. f. 2731; ed. 2. f. 3202.



## 2. *Pyrola bracteata* Hook. Fl. Bor. Am. 2: 47. 1834.

*Thelaia bracteosa* Alef. Linnaea 28: 57, in part. 1856.

*Pyrola bracteata Hillii* J. K. Henry, Torreyia 14: 32. 1914.

Perennial, with a long creeping scaly rootstock; stem above ground 1–5 cm. long; petioles 2–6 dm. long; leaf-blades from orbicular or oval to broadly ovate or subcordate, usually acute at the apex, denticulate, the teeth formed by the excurrent veins, 3–8 cm. long, 2–5 cm. wide, dark-green and shining above, reddish or brownish beneath; scape, including inflorescence, 2–4 dm. long, with 1 or 2 scales below the inflorescence; raceme 10–25-flowered; bracts lanceolate or ovate, 1–1.5 cm. long, acuminate, tinged with rose color; pedicels about 5 mm. long; sepals deltoid-lanceolate, tapering gradually from the base, about 4 mm. long, about 2 mm. broad at the base, sharply acute or acuminate; petals oval, 6–7 mm. long, purple or rose-colored; anthers pinkish or yellowish, nearly 3 mm. long, apiculate at the distal end; style strongly curved, in flower 6–7 mm., in fruit 8–9 mm. long, slightly thickened upwards; stigmas soon longer than the width of the collar; capsule depressed-globose, about 8 mm. wide.

TYPE LOCALITY: Northwest coast of America.

DISTRIBUTION: Open woods, from Oregon and Idaho to Montana and British Columbia.

ILLUSTRATION: Ber. Deuts. Bot. Ges. 30: 563. f. I, 6.

## 3. *Pyrola uliginosa* T. & G.; Torr. Fl. N. Y. 1: 453. 1843.

*Pyrola elata* Nutt. Trans. Am. Phil. Soc. II. 8: 270. 1843.

*Thelaia asarifolia* Alef. Linnaea 28: 54, in part. 1856.

*Thelaia bracteosa* Alef. Linnaea 28: 57. 1856.

*Pyrola rotundifolia incarnata* A. Gray, Syn. Fl. N. Am. 2<sup>1</sup>: 47, in part. 1878. Not *P. rotundifolia incarnata* DC. 1839.

*Pyrola asarifolia incarnata* Fernald, Rhodora 6: 178. 1904.

Perennial, with a long creeping branched rootstock; stem above ground very short; petioles 2–10 cm. long; leaf-blades orbicular to oval, acute at the base, rounded or rarely acutish at the apex, 2–7 cm. long, 1.5–6 cm. wide, dark-green above, paler or sometimes reddish or brownish beneath, crenulate, the veins not excurrent; scape with 1–3 scales, including the raceme 2–4 dm. long; bracts lanceolate, pinkish, about equaling the pedicels, which are about 4 mm. long; flowers 5–20; sepals ovate or ovate-lanceolate, 2.5–3 mm. long, 2 mm. wide, widest just above the base, acute; petals oval, purple, rose, or pink, about 6 mm. long; anthers pinkish, mucronate at the distal end; tubes curved; style in flower 7–8 mm. long, in fruit 8–9 mm. long, thickened upwards; stigmas at last longer than the width of the collar; fruit depressed-globose, about 8 mm. thick.

TYPE LOCALITY: Oriskany, Oneida County, New York.

DISTRIBUTION: Bogs, meadows, and copses, from Nova Scotia to New York, South Dakota, Colorado, Oregon, and Alaska.

ILLUSTRATIONS: Torr. Fl. N. Y. pl. 69; Linnaea 28: pl. 2, f. 9; Britt. & Brown, Ill. Fl. f. 2729; ed. 2. f. 3200; Ber. Deuts. Bot. Ges. 30: 563, f. I, 4; 568, f. II, 2, 3; Brown & Schäffer, Alp. Pl. Can. pl. 56, f. a, b; Henshaw, Mountain Fl. Am. pl. 27 (as *P. asarifolia*).

## 4. *Pyrola asarifolia* Michx. Fl. Bor. Am. 1: 251. 1803.

*Pyrola rotundifolia asarifolia* Hook. Fl. Bor. Am. 2: 46. 1834.

*Thelaia asarifolia* Alef. Linnaea 28: 54. 1856.

Perennial, with a slender creeping rootstock; stem above ground very short; petioles 2–7 cm. long; leaf-blades from suborbicular to rounded-reniform, usually cordate or subcordate at the base, 2–5 cm. long, 2–6 cm. wide, thick, dark-green and shining above, usually brownish or reddish beneath, crenulate, the veins not excurrent; scape with 1 or 2 scales, including the inflorescence 1–2.5 dm. long; bracts reddish, lanceolate, scarcely equaling the pedicels; pedicels about 4 mm. long; flowers 5–15; sepals ovate or ovate-lanceolate, about 3 mm. long and 2 mm. wide, widest just above the base; petals oval, pink or purple, about 5 mm. long; filaments dilated below; anthers 2–2.5 mm. long, mucronate at the distal end; style in flower 7–8 mm., in fruit 8–9 mm. long, thickened upwards; stigmas shorter than the width of the collar; fruit depressed-globose, 7–8 mm. thick.

TYPE LOCALITY: Not given.

DISTRIBUTION: Bogs and wet woods from Nova Scotia to Massachusetts, South Dakota, New Mexico, and Yukon Territory.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2730; ed. 2. f. 3201; Ber. Deuts. Bot. Ges. 30: 563. f. I, 4; 568. f. II, 1; Mathews, Field Book 325.

5. *Pyrola Sartorii* (Alef.) Hemsl. Biol. Centr. Am. Bot. 2: 283. 1881.

*Thelaia Sartorii* Alef. Linnaea 28: 50. 1856.

Perennial, with a long creeping rootstock; stem above ground very short; petioles 1–3 cm. long; leaf-blades ovate-lanceolate, acute at each end, nearly entire, the tips of the veins forming minute callosities, thick, 2–5 cm. long, 1.5–3.5 cm. wide; scape with 2–4 scales, including the inflorescence 1–3 cm. long; flowers 4–10; bracts linear-lanceolate, longer than the pedicels; pedicels about 4 mm. long; sepals lanceolate or ovate-lanceolate, 3–4 mm. long, 2 mm. wide; petals rose-colored, obovate-elliptic; filaments dilated below; anthers 2 mm. long, scarcely mucronate at the distal end; style somewhat thickened above, scarcely longer than the petals.

TYPE LOCALITY: Mount Orizaba, Vera Cruz.

DISTRIBUTION: Mount Orizaba.

ILLUSTRATION: Linnaea 28: *pl. 1, f. 6*.

6. *Pyrola angustifolia* (Alef.) Hemsl. Biol. Centr. Am.  
Bot. 2: 283. 1881.

*Thelaia angustifolia* Alef. Linnaea 28: 52. 1856.

*Pyrola Liebmanii* Lange, Vidensk. Meddel. 1867: 113. 1868.

Perennial, with a slender rootstock; stem above ground 1–3 cm. long; petioles 1–6 cm. long; leaf-blades elliptic or oval, 2–7 cm. long, 1–4 cm. wide, acute or obtuse at the apex, acute and decurrent at the base, coriaceous, minutely and remotely crenulate, with slightly excurrent veins, dark-green above, often brownish beneath; scape with 2–4 scales, including the inflorescence 2–3 dm. high; raceme 8–15-flowered; bracts lanceolate, long-acuminate, longer than the pedicels; sepals lanceolate, acuminate, 5 mm. long, 1.5 mm. wide; petals 7–8 mm. long, rounded, obovate, greenish- or brownish-white; filaments dilated at the base; anthers mucronate at the proximal end; tubes strongly curved; pores elliptic.

TYPE LOCALITY: Mount Orizaba, Vera Cruz.

DISTRIBUTION: Vera Cruz, Puebla, and Oaxaca.

ILLUSTRATION: Linnaea 28: *pl. 1, f. 7*; Vidensk. Meddel. 1867: *pl. 1*.

7. *Pyrola americana* Sweet, Hort. Brit. ed. 2. 341. 1830.

*Pyrola rotundifolia* Michx. Fl. Bor. Am. 1: 251. 1803. Not *P. rotundifolia* L. 1753.

*Pyrola obovata* Bertol. Novi Comm. Acad. Bonon. 6: 427. 1844.

*Thelaia asarifolia* Alef. Linnaea 28: 54, in part. 1856. Not *Pyrola asarifolia* Michx. 1803.

Perennial, with a slender rootstock; stem above ground 1–3 cm. long; petioles 3–10 cm. long; leaf-blades suborbicular, obovate, or oval, tapering at the base, rounded or retuse at the apex, 2.5–8 cm. long, 2.5–7 cm. wide, entire or crenulate, thick, dark-green above, paler or reddish beneath; scape with 1–3 scales, including the inflorescence 2–3 dm. high; bracts lanceolate, 7–8 mm. long, shorter than the pedicels; sepals lanceolate, 3–3.5 mm. long, about twice as long as broad, acute; petals whitish, rounded-obovate, about 7 mm. long; filaments dilated below; anthers nearly 3 mm. long, cuspidate at the distal end; tubes short, curved; fruit depressed-globose, 6–7 mm. broad.

TYPE LOCALITY: Canada.

DISTRIBUTION: Woods, from Nova Scotia to North Carolina, Kentucky, and Wisconsin.

ILLUSTRATIONS: Novi Comm. Acad. Bonon. 6: *pl. 19*; Linnaea 28: *pl. 2, f. 8* (as *Thelaia asarifolia*); Britt. & Brown, Ill. Fl. f. 2726 (as *P. rotundifolia*); ed. 2. f. 3197.

8. *Pyrola borealis* Rydberg, sp. nov.

Perennial, with a scaly rootstock; stem above ground 1–2 cm. long; petioles 3–6 cm. long; leaf-blades suborbicular or round-reniform, or rarely oval, subcordate or rounded at the base, rounded or even acutish at the apex, 2.5–4 cm. long and broad, scarcely crenulate, green and rather dull on both sides, or reddish beneath; scape with 1–3 scales, including the inflorescence 1–2 dm. high; bracts lanceolate or ovate-lanceolate, 6–8 mm. long; pedicels 4–5 mm. long; sepals pinkish, lanceolate, 4–5 mm. long, acute; petals whitish, rather strongly veined, suborbicular, 7 mm. long, somewhat clawed; filaments slightly dilated below; anthers



3 mm. long, rounded at the distal end; tubes very short, somewhat curved; style not exceeding the petals, strongly thickened upwards.

Type collected on the Mackenzie River, *I. S. Onion* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Northwest Territory, Canada, from English River to Fort Norman on the Mackenzie; Alaska.

### 9. *Pyrola Gormanii* Rydberg, sp. nov.

Perennial, with a long creeping rootstock; stem above ground very short; petioles 2–4 cm. long; leaf-blades oval or orbicular, usually acutish at each end, denticulate by the excurrent veins, 2–4 cm. long, 1.5–3 cm. wide, green but rather dull above, sometimes mottled along the veins, pale or pinkish beneath; scape, including the inflorescence, 1–2 dm. high; racemes 3–10-flowered; bracts lanceolate, pinkish, longer than the pedicels; sepals lanceolate, acute, 3 mm. long; petals elliptic, 7 mm. long, brownish-white, veined with purplish; filaments slightly dilated below; anthers about 2 mm. long, rounded at the distal end; tubes very short, almost straight; style about equaling the petals; capsule depressed-globose, 6 mm. thick.

Type collected in Dry Gulch, Yukon Territory, June 14, 1899, *Gorman 1029*, in part\* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Yukon Territory.

### 10. *Pyrola grandiflora* Radius, Diss. Pyr. 27. 1821.

*Pyrola rotundifolia pumila* Hornem. Dansk Oecon. Pl. ed. 3. 463. 1821.

*Pyrola pumila* Hornem.; Cham. & Schlecht. Linnaea 1: 514. 1826.

*Pyrola groenlandica* Hornem. Fl. Dan. pl. 1817. 1840.

*Thelaia grandiflora* Alef. Linnaea 28: 68. 1856.

Perennial, with a creeping rootstock; stem above ground almost none; petioles 1–4 cm. long; leaf-blades orbicular or round-oval, rounded at both ends, scarcely crenulate, thick, reddish-brown beneath or somewhat golden above, sometimes pale along the veins, 1.5–4 cm. long, 1.5–3.5 cm. wide; scape with 1 or 2 scales, including the inflorescence less than 2 dm. high; racemes 5–8-flowered; bracts lanceolate, 4–5 mm. long; sepals elliptic or lance-elliptic, 3–3.5 mm. long, about 1.5 mm. wide, crenulate, rounded or obtuse, rarely acutish at the apex; petals white or tinged with rose, suborbicular, 6–7 mm. long; filaments dilated at the base; anthers light-yellow or pinkish, 2.5 mm. long, obtuse at the distal end; tubes short, curved; style short, not exceeding the petals, thickened upwards.

TYPE LOCALITY: Labrador.

DISTRIBUTION: Arctic and subarctic regions, from Greenland to Newfoundland and the Mackenzie River.

ILLUSTRATIONS: Radius, Diss. Pyr. pl. 3, f. 2; Linnaea 28: pl. 2, f. 12; Fl. Dan. pl. 1817; E. & P. Nat. Pfl. 4<sup>1</sup>: f. 5, F–K.

### 11. *Pyrola occidentalis* R. Br.; D. Don, Mem. Wern.

Soc. 5: 232. 1824.

*Thelaia occidentalis* Alef. Linnaea 28: 36. 1856.

Perennial, with a long creeping rootstock; stem above ground very short; petioles 1–3 cm. long; leaf-blades oval or orbicular, rather thin, rounded to acutish at each end, subentire, only the ends of the veins forming minute callosities, green on both sides or slightly reddish beneath, 2–3 cm. long, 1.5–2.5 cm. wide; scape with 1 or 2 scales, including the inflorescence 7–15 cm. high; raceme short, 3–6-flowered; bracts narrowly ovate to lanceolate, acute, 4–5 mm. long; sepals oblong or elliptic, 2–2.5 mm. long, 1–1.5 mm. wide, sometimes tinged with pink, rounded or obtuse at the apex; petals whitish, veiny, obovate, 5–6 mm. long; filaments filiform; anthers 2 mm. long, oblong, obtuse at the distal end, truncate at the proximal end, without tubular prolongation; style curved, slender, scarcely thickened upwards, not longer than the petals.

TYPE LOCALITY: Sledge Island [near Nome], Alaska.

DISTRIBUTION: Northwestern Alaska.

ILLUSTRATION: Linnaea 28: pl. 1, f. 1.

\* *Gorman 1029* in the U. S. Nat. Herb. belongs to *P. borealis*, while *Gorman 1028* in that herbarium belongs to *P. Gormanii*.

12. *Pyrola chlorantha* Sw. Sv. Vet.-Akad. Nya Handl. 31: 190. 1810.

*Pyrola minor* Pursh, Fl. Am. Sept. 299. 1814. Not *P. minor* L. 1753.

*Pyrola convoluta* W. Barton, Fl. Phila. Prodr. 50. 1815.

*Pyrola asarifolia* Radius, Diss. Pyr. 23, mainly. 1821. Not *P. asarifolia* Michx. 1803.

Perennial, with a long slender rootstock; stem above ground very short; petioles 2–5 cm. long; leaf-blades suborbicular, 1–3 cm. long, rounded at the apex, from rounded to acute at the base, minutely crenulate, dark-green, rather dull; scape usually with a single scale, including the inflorescence 1–2 dm. high; raceme 2–8-flowered; bracts lanceolate, shorter than the pedicels; pedicels 4–5 mm. long; sepals triangular, acutish or obtusish, about as broad as long; petals greenish-white, oval or elliptic, 5–6 mm. long; filaments dilated at the base; anthers oblong, mucronate at the distal end; tubes fully 0.5 mm. long, curved; pores oblique; style somewhat thickened upwards, strongly bent, longer than the petals; capsule depressed-globose, 6 mm. wide.

TYPE LOCALITY: Near Stockholm, Sweden.

DISTRIBUTION: Swamps, from Labrador and Newfoundland to Maryland, Nebraska, Arizona, California, and British Columbia; also in Europe.

ILLUSTRATIONS: Sv. Vet.-Akad. Nya Handl. 31: pl. 5; Radius, Diss. Pyr. pl. 4 (as *P. asarifolia*); Hook. Fl. Bor. Am. pl. 134; Sv. Bot. pl. 453; Fl. Dan. pl. 1693; Bot. Cab. pl. 1542; Hayne, Arzn. Gew. 4: pl. 22 (as *P. media*); Reichenb. Fl. Germ. pl. 1154, f. 1, 2; Fl. Deuts. ed. 5. pl. 2046; Britt. & Brown, Ill. Fl. f. 2727; ed. 2. f. 3198; Henshaw, Mountain Fl. Am. pl. 27.

13. *Pyrola elliptica* Nutt. Gen. 1: 273. 1818.

*Pyrola reticulata* Raf.; DC. Prodr. 7: 773, as synonym. 1839.

*Thelaia elliptica* Alef. Linnaea 28: 47. 1856.

Perennial, with a creeping rootstock; stem above ground very short; petioles 1–4 cm. long; leaf-blades oval, rounded at the apex, often acute at the base, 3–8 cm. long, 1.5–6 cm. wide, rather thin, dull, denticulate; scape with 0–2 scales, including the inflorescence 1–2 cm. high; raceme 6–15-flowered; bracts linear-lanceolate, about equaling the pedicels, 5–6 mm. long; sepals triangular or shortly triangular-ovate, acute or short-acuminate, about 2 mm. long and nearly as broad; petals white, obovate, about 6 mm. long; filaments dilated below; anthers dark-yellow, oblong, obtuse or mucronate at the distal end; tubes short, curved; pores suborbicular; style equaling or slightly exceeding the petals, strongly curved, thickened upwards; fruit 6–7 mm. thick.

TYPE LOCALITY: Philadelphia.

DISTRIBUTION: Nova Scotia to Maryland, South Dakota, New Mexico, and British Columbia.

ILLUSTRATION: Radius, Diss. Pyr. pl. 5, f. 1; Hook. Fl. Bor. Am. pl. 135; Linnaea 28: pl. 1, f. 5; Meehan, Nat. Fl. 2: pl. 32; Britt. & Brown, Ill. Fl. f. 2728; ed. 2. f. 3199; Mathews, Field Book pl. opp. 324.

14. *Pyrola septentrionalis* Andres, Oesterr. Bot. Zeits. 63: 71. 1913.

*Pyrola blanda* Andres, Oesterr. Bot. Zeits. 63: 72. 1913.

*Pyrola Conardiana* Andres, Oesterr. Bot. Zeits. 63: 73. 1913.

Perennial, with a strong rootstock; stem above ground very short; leaves numerous; petiole as long as the blade or shorter; blades oval or ovate, rarely elliptic, acute, sharply dentate or serrate, dark-green above, dull, brownish beneath; scape 1–2 dm. high, with 1 or 2 oval scales, reddish or purplish; raceme many-flowered; bracts lanceolate, as long as the pedicels, reflexed; sepals lanceolate, pointed, 3.5–5 mm. long, 1.5–2.5 mm. wide; petals oval, 6–9 mm. long, white or greenish-white with pale throat; anthers 2.5–3.5 mm. long; style thin, longer than the corolla.

TYPE LOCALITY: Oregon.

DISTRIBUTION: Oregon and California.

ILLUSTRATION: Oesterr. Bot. Zeits. 63: 74. f. 1–13.

15. *Pyrola picta* Smith, in Rees, Cycl. 29: *Pyrola* no. 8. 1814.

*Thelaia spathulata* Alef. Linnaea 28: 45, in part. 1856.

Perennial, with a caespitose rootstock; stem above ground 1–5 cm. long; petioles 1–4 cm. long; leaf-blades ovate or rounded-ovate, usually acute at the apex, denticulate or entire, 2–6 cm. long, 1–5 cm. wide, the upper surface green and white-mottled along the veins, the lower usually tinged with red or else pale; scape with 1–3 scales, including the inflorescence 1–2



dm. high, often brownish; raceme 5-15-flowered; bracts lanceolate, purple-tinged, much shorter than the pedicels; pedicels about 5 mm. long; sepals about 1.5 mm. long and broad, ovate-deltoid, acute; petals greenish-white or brownish without; filaments dilated below; anthers oblong, apiculate at the distal end; tubes nearly 1 mm. long; pores large, suborbicular; style scarcely longer than the petals, thickened upwards; stigma shorter than the thickness of the style.

TYPE LOCALITY: West coast of North America.

DISTRIBUTION: Woods, from New Mexico and Colorado to California and British Columbia.

ILLUSTRATION: M. E. Parsons, Wild Fl. Calif. 101.

16. *Pyrola dentata* Smith, in Rees, Cycl. 29: *Pyrola* no. 6. 1814.

*Thelaia spathulata* Alef. Linnaea 28: 45, in part. 1856.

*Pyrola dentata integra* A. Gray; Cooper, Pacif. R. R. Rep. 12: 54. 1860.

*Pyrola pallida* Greene, Pittonia 4: 39. 1899.

*Pyrola picta dentata* Piper, Contr. U. S. Nat. Herb. 11: 434. 1906.

*Pyrola picta integra* Piper, Contr. U. S. Nat. Herb. 11: 434. 1906.

Perennial, with a caespitose rootstock; stem above ground very short; petioles 1-3 cm. long; leaf-blades oblanceolate, obovate, or spatulate, dentate or entire, acute or the earlier obtuse at the apex, tapering at the base, 1.5-6 cm. long, 1-4 cm. wide, green on both sides, not mottled, sometimes rather pale and glaucous (*P. pallida* Greene); scape with 1-3 small scales, including the inflorescence 1-2 dm. high, sometimes tinged with purple; raceme 5-15-flowered; bracts lanceolate, scarcely half as long as the pedicels; pedicels 4-5 mm. long; sepals deltoid, 1.5 mm. long; petals obovate, about 5 mm. long, greenish-white or brownish without except the margin; filaments dilated below; anthers oblong, 3 mm. long, mucronate at the distal end; tubes 0.5 mm. long, curved; fruit about 6 mm. thick.

TYPE LOCALITY: West coast of North America.

DISTRIBUTION: Montana and British Columbia to central California and Nevada.

ILLUSTRATION: Hook. Fl. Bor. Am. pl. 136.

17. *Pyrola aphylla* Smith, in Rees, Cycl. 29: *Pyrola* no. 7. 1814.

*Pyrola aphylla leptosepala* Nutt. Trans. Am. Phil. Soc. II: 8: 271. 1843.

*Thelaia aphylla* Alef. Linnaea 28: 39. 1856.

Perennial, usually leafless, with a branched creeping scaly rootstock; stem above ground usually none; scape 1-3 dm. high, often tinged with red, usually more scaly than in the other species, rarely with a few small leaves at the base, these obovate or oblanceolate, acute, 1-2 cm. long, sessile or tapering into a short and broad petiole; racemes 8-25-flowered; bracts 3-5 mm. long, lanceolate; pedicels about 5 mm. long, recurved; sepals ovate-triangular, acute, as long as broad or slightly longer, about 1.5 mm. in length; petals obovate, 6-8 mm. long, whitish, or tinged with brown or green on the outside; filaments dilated below; anthers 3 mm. long, apiculate at the distal end; tubes nearly 1 mm. long, curved; pores small, oblique; style 6-8 mm. long, thickened upwards.

TYPE LOCALITY: West coast of North America.

DISTRIBUTION: Pine woods, from British Columbia to Montana, Idaho, and southern California.

ILLUSTRATIONS: Hook. Fl. Bor. Am. pl. 137; Bot. Gaz. 25: pl. 16.

18. *Pyrola sparsifolia* Suksd. Allg. Bot. Zeits. 12: 26. 1906.

*Pyrola aphylla paucifolia* Howell, Fl. NW. Am. 1: 425. 1901.

*Pyrola paradoxa* Andres, Verh. Bot. Ver. Prov. Brand. 54: 220. 1912.

Perennial, with a slender rootstock; stem above ground very short; scape slender, 1-2 dm. high, with several scales and often with 1-3 leaves at the base, and one or two scales above; leaves if present short-petioled; blades orbicular or oval, often apiculate, and sometimes dentate above, 1-2 cm. long; racemes 4-10-flowered; bracts 2-3 mm. long, much shorter than the pedicels; sepals triangular, acute, as broad as long; petals greenish-white, elliptic, 7-8 mm. long; filaments dilated below; anthers 3 mm. long, mucronate at the distal end; tubes short, curved; style about 5 mm. long, slightly thickened upwards.

TYPE LOCALITY: Thick woods at "Moosbach" [Moss Creek], Skamania County, Washington.

DISTRIBUTION: Pine woods, Olympic and Cascade mountains, Washington.

ILLUSTRATIONS: Verh. Bot. Ver. Prov. Brand. 54: 221. f. II, 2; Oesterr. Bot. Zeits. 63: 74. f. 14.

19. *P. mazamiae* sp. nov.

Per. slender rootstock <sup>not scaly</sup> Stem above ground none. Scape 2 dm ±, red to pink, no leaves, scales present 1 cm. 2-3 scales above ground, racemes 5-15 flowered. Bracts 3-8 mm long equaling or exceeding pedicels. petals pink with white margin (green or brown)

leaves, if present, below surface of duff, white to pink. 1 ± cm long lanceolate - oblanceolate

## DOUBTFUL AND EXCLUDED SPECIES

*Pyrola rotundifolia* L. Sp. Pl. 396. 1753. This is a European species, for which *P. americana* has been mistaken.

*Pyrola urceolata* Poir. in Lam. Encyc. 5: 743 (1804), is *Galax aphylla*.

*Pyrola flexuosa* Raf. Atl. Jour. 151. 1832. This is wholly unknown.

*Pyrola rotundifolia incarnata* DC. Prodr. 7: 773 (1839) (*P. incarnata* Fisch.; DC. loc. cit., as synonym), is wholly Asiatic. It is more closely related to *P. bracteosa* than to *P. uliginosa* and *P. asarifolia*, having the longer sepals of the former, but the leaves less denticulate.

2. *ERXLEBENIA* Opiz, Seznam 41. 1852.

*Amelia* Alef. Linnaea 28: 25. 1856.

Perennial herbs, with slender rootstocks; stem above ground very short, bearing a cluster of petioled leaves. Leaf-blades elliptic, crenulate, evergreen, but not very thick. Scape with a few scales similar to the bracts. Flowers racemose on short recurving pedicels. Sepals 5. Corolla nearly globose; petals 5, free, orbicular, concave. Stamens 10; filaments erect, subulate, connivent; anthers oblong, opening by oblique pores at the ends, the tubes obsolete. Pistil of 5 united carpels; ovary with 5 rounded angles; style straight, in ours short and erect, without a collar; stigma peltate, thicker than the style, with 5 marginal spreading papillae. Capsule depressed-globose, umbilicate, 5-valved, dehiscent from the base upwards, the valves connected by arachnoid threads.

Type species, *Erxlebenia rosea* Opiz.

1. *Erxlebenia minor* (L.) Rydberg.

*Pyrola minor* L. Sp. Pl. 396. 1753.

*Pyrola rosea* Smith, Engl. Bot. pl. 2543. 1813.

*Pyrola minor conferta* Cham. & Schlecht. Linnaea 1: 514. 1826.

*Erxlebenia rosea* Opiz, Seznam 41. 1852.

*Amelia minor* Alef. Linnaea 28: 25. 1856.

*Pyrola minor minor* Ledeb. Fl. Ross. 2: 930. 1846.

*Pyrola conferta* Fisch.; Ledeb. Fl. Ross. 2: 930, as synonym. 1846.

Perennial, with a slender rootstock; petioles 1–3 cm. long; leaf-blades oval or orbicular, 1–4 cm. long, crenate, rather thin; scape with 1 or 2 scales, 1–2 dm. high; raceme short, 5–17-flowered; bracts subulate, 2–3 mm. long, about equaling the pedicels; sepals triangular, acute or short-acuminate, as broad as long; corolla white or rose-colored, subglobose; petals orbicular, concave, 3–4 mm. long; anthers ovate, mucronate, dehiscent by 2 pores; tubes obsolete; style erect, about 1 mm. long; capsule about 6 mm. thick.

TYPE LOCALITY: Colder part of Europe.

DISTRIBUTION: Bogs, from Labrador to New England, Minnesota, Colorado, California, and Alaska; also Europe and northern Asia.

ILLUSTRATIONS: Engl. Bot. pl. 2543; Radius, Diss. Pyr. pl. 1, 2; Fl. Dan. pl. 55; Sv. Bot. pl. 550; Bild. Nord. Fl. pl. 153; Baxter, Brit. Bot. pl. 239; Hayne, Arzn. Gew. 4: pl. 23; Reichenb. Fl. Germ. 17: pl. 1155, f. III, IV, 6–11; Fl. Deuts. ed. 5. pl. 2048; Britt. & Brown, Ill. Fl. f. 2732; ed. 2. f. 3203.

3. *RAMISCHIA* Opiz, Seznam 82. 1852.

*Actinocyclus* Klotzsch, Monats. Akad. Berlin 1857: 14. 1857.

Perennials, with creeping rootstocks, often more or less suffrutescent. Leaves petioled; blades evergreen, but thin, serrate, ovate or lanceolate, or rarely oval. Flowers in secund racemes. Sepals 5. Corolla campanulate, white; petals 5, distinct, elliptic, with 2 tubercles inside. Stamens 10; filaments erect, subulate, scarcely dilated, exserted; anthers oblong, attached very near the end, opening by large pores; tubes wanting. Pistil of 5 united carpels; ovary obtusely 5-angled, subglobose, with 10 triangular nectaries at the base; style erect, straight, filiform, exserted; stigma peltate, much broader than the style, with 5 marginal diverging papillae. Capsule depressed-globose, umbilicate, dehiscent from the bottom to the apex, the valves connected by arachnoid threads.

Type species, *Ramischia secundiflora* Opiz.

Leaf-blades ovate or oval, thin, minutely serrulate; bracts lanceolate.

Leaf-blades lanceolate or lance-elliptic, thicker, sharply serrulate; bracts linear.

1. *R. secunda*.

2. *R. elatior*.



1. *Ramischia secunda* (L.) Garcke, Fl. Deuts. ed. 4. 222. 1858.

*Pyrola secunda* L. Sp. Pl. 396. 1753.

*Ramischia secundiflora* Opiz, Seznam 82. 1852.

*Actinocyclus secundus* Klotzsch, Monats. Akad. Berlin 1857: 14. 1857.

*Pyrola secunda pumila* Paine, Cat. Pl. Oneida Co. 135. 1865.

Perennial, with a long creeping rootstock; stems above ground more or less subligneous, 1–10 cm. high, bearing 1–4 leaves; petioles 1–2 cm. long; leaf-blades evergreen, but rather thin, shining, bright-green, finely serrulate, ovate or rarely oval, acute or rarely rounded at the apex, 1–5 cm. long; scape 1–2 dm. high, with 1–4 scales; raceme short, nodding, 6–17-flowered; bracts subulate-ovate, slightly shorter than the pedicels; sepals oval or elliptic, 1 mm. long, rounded at the apex; petals oblong or elliptic, 4–5 mm. long, erect, greenish-white; anthers 1–1.5 mm. long; style about 4 mm. long; capsule subglobose, 4 mm. in diameter.

TYPE LOCALITY: Woods of northern Europe.

DISTRIBUTION: Woods, from Labrador and Newfoundland to New Jersey, South Dakota, New Mexico, California, and Alaska; also in Europe and northern Asia.

ILLUSTRATIONS: Fl. Dan. *pl.* 402; Engl. Bot. *pl.* 517; Sv. Bot. *pl.* 566; Reichenb. Fl. Germ. 17: *pl.* 1155, *f.* I, II, 1–5; Fl. Deuts. ed. 5. *pl.* 2043; Britt. & Brown, Ill. Fl. *f.* 2733; ed. 2. *f.* 3104; Henshaw, Mountain Fl. Am. *pl.* 28.

2. *Ramischia elatior* (Lange) Rydberg, sp. nov.

*Actinocyclus secundus elatior* Lange, Vidensk. Meddel. 1867: 115. 1868.

Perennial, with a creeping rootstock; stems above ground 3–10 cm. high, suffrutescent, bearing 3–6 leaves; petioles 1–2 cm. long; leaf-blades lanceolate or lance-elliptic, 1–5 cm. long, very acute, sharply serrate, firmer than in the preceding species; scape 1.5–3 dm. high, with 2–4 scales; raceme 10–18-flowered, secund; bracts linear, fully as long as the reflexed pedicels; sepals triangular, obtuse, as broad as long; petals elliptic, 5 mm. long, whitish; anthers fully 1.5 mm. long; style 3–4 mm. long.

TYPE LOCALITY: La Hoya, Vera Cruz.

DISTRIBUTION: Mount Orizaba and vicinity.

4. *MONESES* Salisb.; S. F. Gray, Nat. Arr. Brit. Pl. 2: 403. 1821.

*Bryophthalmus* E. Meyer, Preuss. Pflanzeng. 101. 1839.

Glabrous perennial herbs, with slender rootstocks. Leaves thin, petioled, subverticillate, mostly in 3's, persistent. Scape 1-flowered, occasionally with a single scale on the lower part and a similar bract above. Sepals 5, inserted on a callous base. Petals 5, ovate, nearly plane, spreading. Stamens 10; filaments dilated at the base; anthers oblong, large, strongly sulcate, produced into two distinct curved tubes at the apex. Gynoecium of 5 united carpels; disk none; style straight, longer than the ovary; stigma broader than the style, peltate, with 5 marginal erect papillae. Capsule subglobose, obtusely 5-angled, umbilicate, dehiscent from the apex downward, the sutures without filaments.

Leaf-blades suborbicular, mostly rounded at the apex, crenate, not strongly veined.

Leaf-blades more or less ovate, acutish, rather coarsely dentate, strongly reticulate-veiny.

1. *M. uniflora*.

2. *M. reticulata*.

1. *Moneses uniflora* (L.) A. Gray, Man. 273. 1848.

*Pyrola uniflora* L. Sp. Pl. 397. 1753.

*Moneses grandiflora* S. F. Gray, Nat. Arr. Brit. Pl. 2: 403. 1821.

Perennial, with a filiform rootstock; stem above ground 1–3 cm. long, bearing 1–4 pseudoverticils of 2–4, usually 3, leaves each; petioles 0.5–3 cm. long; leaf-blades orbicular or rounded-oval, usually rounded at the apex, acute at the base, 1–2 cm. long, crenate, not strongly veined; scape 5–12 cm. high; bract elliptic; sepals ovate, obtuse, ciliolate on the margins, 3 mm. long; petals white, ovate, obtuse, about 1 cm. long; anthers 2–2.5 mm. long, about half as long as the filaments; tubes about 0.5 mm. long, strongly curved; capsule 7–8 mm. in diameter.

TYPE LOCALITY: Woods of northern Europe.

DISTRIBUTION: Woods, among moss or fallen leaves, from Labrador and Newfoundland to Pennsylvania, Minnesota, New Mexico, and Alaska; also in Europe.

ILLUSTRATIONS: Fl. Dan. *pl.* 8; Sv. Bot. *pl.* 176; Engl. Bot. *pl.* 146; Schrank, Fl. Monac. 3: *pl.* 272; Reichenb. Fl. Germ. 17: *pl.* 1156, *f.* I–III; Fl. Deuts. ed. 5. *pl.* 2049; Britt. & Brown, Ill. Fl. *f.* 2734; ed. 2. *f.* 3205; Henshaw, Mountain Fl. Am. *pl.* 29; E. & P. Nat. Pfl. 4: *f.* 5, L, M; Brown & Schäffer, Alp. Fl. Can. *pl.* 56, *f.* c; Mathews, Field Book 323.



## 2. *Moneses reticulata* Nutt. Trans. Am. Phil. Soc. II. 8: 271. 1843.

Perennial, with a slender rootstock, in habit closely resembling the preceding; petioles 1–2 cm. long; leaf-blades rounded-ovate, usually acute, 1–2.5 cm. long, rather coarsely dentate and strongly veiny; scape 5–10 cm. long, with a single elliptic bract, otherwise naked; sepals oval, 3 mm. long, rounded at the apex, ciliolate; petals white, about 1 cm. long, ovate, obtuse; anthers nearly 3 mm. long, slightly shorter than the filaments; tubes about 0.5 mm. long; capsule about 1 cm. in diameter, longer than the style.

TYPE LOCALITY: Shady fir woods of the Oregon [Columbia River].

DISTRIBUTION: Washington to Montana and Alaska.

## 5. *CHIMAPHILA* Pursh, Fl. Am. Sept. 279. 1814.

*Pseva* Raf. Jour. Phys. 89: 261. 1819.

*Chimaza* R. Br.; DC. Prodr. 7: 775, as a synonym. 1839.

Suffrutescent perennials, with creeping rootstocks. Stems branched. Leaves subverticillate, coriaceous, evergreen, short-petioled, usually serrate, dark-green and shining above, paler beneath, the veins more or less impressed on the upper surface. Flowers subumbellate, corymbose, or racemose. Sepals 5. Petals 5, white, rose-colored, or purplish. Stamens 10; filaments expanded into an ovate, obovate or suborbicular disk near the base, then curved upwards; anthers ventricose, inflated, attached near the middle; tubes distinct, rather long. Gynoecium of 5 united carpels; ovary umbilicate, rounded, 5-lobed; style straight, almost none; stigma peltate, flat, 5-radiate but without papillae. Capsule 5-celled, depressed, ovoid or obovoid or globose, dehiscent from the apex, the sutures without threads.

Type species, *Pyrola maculata* L.

Bracts linear or subulate.

Dilated portion of the filaments glabrous or merely ciliolate on the margin; leaves oblanceolate or spatulate, not mottled.

Sepals fully as broad as long, mostly obtuse.

Leaf-blades with rather indistinct lateral veins; pedicels ascending, not recurved; stem terete.

Leaf-blades with more prominent lateral veins; pedicels in anthesis spreading, recurved; stem more or less round-angled.

Plant 1–2 cm. high; capsule 5–6 mm. in diameter.

Dilated portion of the filaments obovate, ciliolate; pedicels glandular-granuliferous.

Dilated portion of the filaments ovate, not ciliolate; pedicels glabrous.

Plant 2–3 cm. high; capsule nearly 1 cm. in diameter.

Sepals longer than broad, acute.

Dilated portion of the filaments villous; leaves lanceolate or ovate, more or less mottled.

Leaf-blades narrowly lanceolate, acuminate.

Tubes of the anthers about 1 mm. long.

Tubes of the anthers about 2 mm. long.

Leaf-blades broadly lanceolate or ovate, acute.

Tube about one fourth of the whole anther.

Tube about one third of the whole anther.

Bracts obovate.

1. *C. occidentalis*.

2. *C. corymbosa*.

3. *C. domingensis*.

4. *C. mexicana*.

5. *C. acuta*.

6. *C. acuminata*.

7. *C. guatemalensis*.

8. *C. maculata*.

9. *C. dasystemma*.

10. *C. Menziesii*.

## 1. *Chimaphila occidentalis* Rydberg, sp. nov.

*Chimaphila umbellata* Alef. Linnaea 28: 78, in part. 1856.

Suffruticose perennial; stem branched, 1–2 dm. high, often greenish, terete; leaves in verticils of 3–8, usually broadly oblanceolate, 2–7 cm. long, sharply serrate, except towards the base, acute, dark-green and very glossy above, yellowish-green beneath, the lateral veins almost obsolete; peduncles about 1 cm. long; inflorescence corymbose or racemose; bracts linear-subulate, deciduous; pedicels in flower ascending, rarely if at all recurved, in fruit erect; sepals broadly ovate, broader than long, obtuse, erose; petals oval, 5–6 mm. long, concave, ciliolate; dilated portion of the filaments ovate, ciliolate; anthers about 2.5 mm. long, attached slightly nearer the pore-bearing ends; stigma about half as broad as the ovary; capsule subglobose, 6–7 mm. in diameter.

Type collected in the valley of Pine Creek, near Farmington, Latah County, Idaho, June 28, 1892, Sandberg, MacDougal & Heller 519 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Woods, from British Columbia to California, Colorado, and Montana.

ILLUSTRATION: Brown & Schäffer, Alp. Fl. Can. 57 (as *C. umbellata*).



## 2. *Chimaphila corymbosa* Pursh, Fl. Am. Sept. 300. 1814.

*Chimaphila umbellata* W. Barton, Veg. Mat. Med. 1: 17, in part. 1817. Not *Pyrola umbellata* L. 1753.  
*Pyrola corymbosa* Bertol. Novi Comm. Acad. Bonon. 6: 428. 1844.

Suffruticose perennial; stems 5–15 cm. high, often branched, brown or grayish, more or less angled, especially under the nodes; leaves in verticils of 3–7; petioles very short; blades narrowly oblanceolate or the earlier broader, 2.5–7 cm. long, dark-green and shining above, pale and with rather strong lateral veins beneath, entire towards the base, sharply serrate above, decidedly acute with a large terminal tooth; pedicels in flower divergent, and somewhat recurved, in fruit becoming nearly erect; sepals broadly ovate, as broad as long, erose; petals elliptic, ciliate, greenish-white, tinged with rose; dilated portion of the filaments obovate, ciliate on the margins; anthers about 2 mm. long, attached at the middle; stigma two thirds as broad as the ovary; capsule obovoid-subglobose, about 6 mm. in diameter.

TYPE LOCALITY: Canada.

DISTRIBUTION: Woods, from Nova Scotia to Georgia and Wisconsin; Santo Domingo.

ILLUSTRATIONS: Novi Comm. Acad. Bonon. 6: *pl.* 20; Bot. Mag. *pl.* 778; Bigel. Med. Bot. *pl.* 21; W. Barton, Veg. Mat. Med. *pl.* 1; Meehan's Mo. 7: *pl.* 9; Mathews, Field Book 320. *f.* 1.

## 3. *Chimaphila domingensis* Blake, Jour. Bot. 52: 169. J1 1914.

Differs from *C. corymbosa* by having obtuse leaves, glabrous pedicels, and the ovate, dilated part of the filaments eciliate.

TYPE LOCALITY: Pine woods, Valle Nuevo, near Constanza, Santo Domingo.

DISTRIBUTION: Santo Domingo.

## 4. *Chimaphila mexicana* (DC.) Rydberg, sp. nov.

*Chimaphila umbellata mexicana* DC. Prodr. 7: 775. 1839.

Suffruticose perennial; stem angled, 2 dm. or more high; leaves in verticils of 4–7, oblanceolate, 3–10 cm. long, very sharply serrate, acute, dark-green above, paler and with prominent lateral veins beneath; peduncles about 1 dm. long; bracts linear-subulate, almost filiform; pedicels in anthesis more or less spreading and recurved; sepals broadly ovate, as broad as long, erose; petals rose-colored, oval, about 7 mm. long; dilated portion of the filaments obovate, ciliate on the margins; anthers about 3 mm. long, attached at the middle; capsule globose-obovoid, nearly 1 cm. in diameter; stigma less than half as broad as the ovary.

TYPE LOCALITY: Near City of Mexico.

DISTRIBUTION: Southern Mexico.

## 5. *Chimaphila acuta* Rydberg, sp. nov.

Suffruticose perennial; stem about 1 dm. high, greenish, terete; leaves in verticils of 3–5, oblanceolate, 2–6 cm. long, dark moss-green above, yellowish-green beneath, sharply serrate except towards the base, acute, the lateral veins distinct but not very strong beneath; peduncles about 1 dm. long; inflorescence corymbose or subumbellate; bracts linear-subulate; pedicels in anthesis spreading, in fruit erect; sepals triangular-ovate, longer than broad, acute; petals oval, about 6 mm. long; dilated portion of the filaments obovate; anthers 2.5–3 mm. long, attached near the middle; capsule obovoid, about 7 mm. broad.

Type collected near top of "Rim rock," Tonto Basin, Arizona, August 2, 1887, *Mearns* 136 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Arizona and New Mexico.

## 6. *Chimaphila acuminata* (Lange) Rydberg, sp. nov.

*Chimaphila maculata acuminata* Lange, Vidensk. Meddel. 1867: 112. 1868.

Suffruticose perennial; stem terete, 1–2 dm. high; leaves in verticils of 3–5, narrowly lanceolate or the lower broader, acuminate, sharply serrate with narrow irregular teeth, directed forward, 2–5 cm. long, dark-green above and mottled along the veins, reddish beneath; peduncles more than 1 dm. long; inflorescence 1–3-flowered; bractlets subulate; sepals rounded-ovate, obtuse, ciliate, as broad as long; petals orbicular, about 8 mm. long; dilated portion of the filaments obovate or obcordate; anthers 3 mm. long, attached at the middle.

TYPE LOCALITY: Alpatlahua, (Vera Cruz.)

DISTRIBUTION: Southern Mexico.



### 7. *Chimaphila guatemalensis* Rydberg, sp. nov.

Suffruticose perennial; stem terete, 1–2 dm. high; leaves narrowly lanceolate, acuminate, 6–8 cm. long, sharply serrate with slender teeth, dark-green and often mottled above, brown beneath; peduncles about 15 cm. long; inflorescence subumbellate, 1–3-flowered; sepals semi-oval, as long as broad, erose; petals orbicular, 8 mm. long; dilated portion of the filaments flabelliform, villous; anthers 4 mm. long, with unusually long tubes; fruit not known.

Type collected at Santiago, Department of Zacatepeques, Guatemala, *Rosalio Gomes* [J. D. Smith, Pl. Guat. no.] 795 (herb. Columbia Univ.).

DISTRIBUTION: Guatemala and Costa Rica.

### 8. *Chimaphila maculata* (L.) Pursh, Fl. Am. Sept. 300. 1814.

*Pyrola maculata* L. Sp. Pl. 396. 1753.

*Pyrola* or *Chimaphila Durandii* Raf. Atl. Jour. 119. 1832.

Suffruticose perennial; stem terete, 1 dm. high or less; leaves in verticils of 2–4, short-petioled; leaves lanceolate, often narrowly so, acute at the apex, sharply serrate with few callous-tipped teeth, 1.5–7 cm. long, dark-green above, mottled along the veins with white or light green, reddish-brown beneath, with faint lateral veins; peduncles 1 dm. long or less; inflorescence subumbellate, 1–4-flowered; flowers nodding; bracts linear-setaceous or none; sepals elliptic, ciliolate, obtuse; petals oval, ciliolate, white or rose-colored; dilated part of the filaments obovate, villous especially on the margin, 6 mm. long; anthers 2.5–3 mm. long, attached near the middle; capsule depressed-globose, about 7 mm. broad.

TYPE LOCALITY: Woods of North America.

DISTRIBUTION: Woods, from Massachusetts to Georgia, Alabama, Ohio, and Ontario.

ILLUSTRATIONS: Radius, Diss. Pyr. pl. 5, f. 2; Bot. Mag. pl. 897; Bot. Cab. pl. 708; Raf. Med. Bot. pl. 79; W. Barton, Fl. N. Am. pl. 11; Torr. Fl. N. Y. pl. 70; Meehan's Mo. 9: pl. 1; Britt. & Brown, Ill. Fl. f. 2735; ed. 2. f. 3206; Mathews, Field Book 321. f. 2.

### 9. *Chimaphila dasystemma* Torrey (in herb.), sp. nov.

Suffruticose perennial; stem terete, rarely more than 1 dm. high; leaves in verticils of 2–4, usually very thick, ovate, 2–6 cm. long, with few, usually rather small teeth, acute, dark-green above and more or less mottled along the veins; peduncles about 1 dm. long; inflorescence subumbellate, 1–4-flowered; bracts small, lanceolate or subulate; pedicels more or less spreading; sepals rounded-ovate, obtuse, erose; petals white or pink, orbicular, 6–7 mm. long; dilated part of the filaments broadly obovate or orbicular, villous; anthers about 3 mm. long; capsule obovoid, about 8 mm. thick.

Type collected in Mexico [definite locality not given], *Thomas Coulter* (herb. Columbia Univ.).

DISTRIBUTION: From Sonora to Guatemala.

### 10. *Chimaphila Menziesii* (R. Br.) Spreng. Syst. 2: 317. 1825.

*Pyrola Menziesii* R. Br.; D. Don, Mem. Wern. Soc. 5: 245. 1824.

Suffruticose perennial; stems slender, terete, 5–15 cm. high; leaves less distinctly verticillate than in the other species, some single, others opposite or in verticils of 3 or 4, ovate, more closely serrate, 1–5 cm. long, acute, shining, less thick, reddish beneath, rarely mottled; peduncles about 5 cm. long; inflorescence corymbose or subumbellate; bracts rotund or broadly obovate; pedicels often spreading; sepals suborbicular, erose; petals white, veiny, orbicular, 6 mm. long, spreading, slightly concave; dilated portion of the stamens obcordate, somewhat villous on the margins; anthers 2–2.5 mm. long, attached at the middle; capsule depressed-globose, about 7 mm. thick.

TYPE LOCALITY: Northwest coast of America.

DISTRIBUTION: Pine woods, from British Columbia to central California and Idaho.

ILLUSTRATIONS: Hook. Fl. Bor. Am. pl. 138; E. & P. Nat. Pfl. 4: f. 5, A–E; M. E. Parsons, Wild Fl. Calif. 105.

#### EXCLUDED SPECIES

CHIMAPHILA UMBELLATA (L.) W. Barton, Veg. Mat. Med. 1: 17. 1817. (*Pyrola umbellata* L. Sp. Pl. 396. 1753.) This is a European species with which our American species has been confused, differing from *C. corymbosa* in the smaller subovoid capsule, which is thicker below the middle, ovate sepals, longer than broad, shorter stamens, and obtusish leaf-blades. Alefeld, who distinguished the two, admitted *C. umbellata* to the west coast, but his specimens were evidently depauperate northern ones of *C. occidentalis*.



## Family 5. ERICACEAE

BY JOHN KUNKEL SMALL\*

Perennial herbs, or shrubs or trees. Leaves alternate, opposite, or whorled, without stipules, often persistent; blades simple, membranous or leathery, flat, revolute, or keeled, or grooved on the back, entire or toothed, sessile or petioled. Flowers perfect, solitary in the axils, or in axillary or terminal clusters, racemes, or panicles. Calyx of 4–7 nearly distinct or partly united sepals. Corolla of 4–7 distinct or partly united petals, various in shape, regular or 2-lipped, white, variously colored, or variegated; tube short or elongate, sometimes with sacs which hold the anthers before anthesis; lobes erect, spreading, or recurved. Androecium of as many or twice as many hypogynous stamens as there are petals or corolla-lobes; filaments distinct or nearly so, sometimes flattened and dilated, often appendaged, straight or sigmoid-curved; anthers 2-celled, upright, the sacs introrse, opening lengthwise or by chinks or terminal pores, sometimes prolonged into apical tubes, often appendaged. Pollen-grains compound. Gynoecium 2–7-carpellary, the carpels united or distinct. Ovary superior, 2–7-celled, often prominently lobed, sessile on an annular or a lobed disk; style compound, slender, columnar or fusiform; stigma minute, discoid or slightly lobed. Ovules usually numerous, anatropous. Fruit a capsule, either exposed or included in the accrescent fleshy calyx and thus baccate, or truly baccate or drupaceous. Seeds numerous or rarely few.

Ovary ripening into a capsule, this either exposed or enclosed in the persistent corolla or accrescent calyx.

Capsule exposed or enclosed in the accrescent calyx; corolla deciduous after anthesis.

Calyx not accrescent; corolla deciduous; capsule exposed.

Capsule septicidal.

Corolla of distinct petals.

Anther-sacs opening by apical pores.

Petals 6 or 7, long-clawed; stamens 12 or 14; flowers not from scaly buds.

Petals 5, clawless; stamens 5 or 10; flowers from cone-like scaly buds.

Anther-sacs opening lengthwise.

Anthers globular-didymous.

Anthers oblong, oval, or sagittate.

Calyx-lobes short and broad; flowers in terminal panicles.

Calyx-lobes long and narrow; flowers solitary in the axils.

Corolla of partly united petals.

Anther-sacs opening lengthwise.

Anther-sacs opening by pores.

Corolla decidedly 2-lipped, mostly funnelform.

Corolla with a long tube; limb slightly 2-lipped, the lobes nearly equal.

Corolla split to the base below, the tube very short, the limb strongly 2-lipped, the upper lip 3-lobed at the apex, the lower lip with 2 long narrow lobes.

Corolla not 2-lipped, often campanulate, urceolate, rotate, or saucer-shaped.

1. BEFARIA.
2. LEDUM.
3. DENDRIUM.
4. ELLIOTTIA.
5. CLADOTHAMNUS.
6. LOISELEURIA.
7. AZALEA.
8. RHODORA.

\* The genus *Uva-ursi* by LE ROY ABRAMS.

- Flower-buds, and usually leaf-buds, scaly-strobilaceous.  
 Corolla campanulate or rotate-campanulate.  
 Calyx-lobes foliaceous.  
 Corolla open to the base on the lower side. 9. *THERORHODION*.  
 Corolla not open to the base on the lower side. 10. *AZALEASTRUM*.  
 Calyx-lobes small, minute or obsolete.  
 Upper corolla-lobe interior; calyx-lobes small, but prominent; leaves persistent, the blades leathery. 11. *RHODODENDRON*.  
 Upper corolla-lobe exterior; calyx-lobes minute; leaves deciduous, the blades membranous. 12. *BILTIA*.  
 Corolla urceolate, globose-urceolate, or cylindrical. 13. *MENZIESIA*.  
 Flower-buds and leaf-buds not scaly-strobilaceous. 14. *PHYLLODOCE*.  
 Corolla campanulate to urceolate.  
 Corolla saucer-shaped.  
 Calyx persistent; corolla-lobes rounded; capsule depressed. 15. *KALMIA*.  
 Calyx deciduous; corolla-lobes acute; capsule ovoid. 16. *KALMIELLA*.  
 Capsule loculicidal or marginicidal.  
 Anther-sacs opening by apical pores or chinks or by chinks above the middle; capsule loculicidal.  
 Calyx-lobes imbricate, at least in the bud.  
 Corolla urceolate, ovoid, pyramidal, conic, or cylindrical; anthers fixed nearly at the base.  
 Capsule depressed; anther-sacs opening by apical pores or chinks.  
 Capsule-walls double, the outer 5-valved, the inner 10-valved. 17. *CHAMAEDAPHNE*.  
 Capsule-walls single, 5-valved. 18. *EUBOTRYS*.  
 Anthers awned; panicles terminal.  
 Anthers awnless; panicles axillary.  
 Flower-stalks scaly above the base; calyx-lobes broad, of an ovate type; panicles axillary along the branches. 19. *LEUCOTHOE*.  
 Flower-stalks scaly only at the base; calyx-lobes narrow, of an oblong or lanceolate type; panicles 2 to several at the ends of the branches. 20. *OREOCALLIS*.  
 Capsule elongate; anther-sacs opening by chinks above the middle. 21. *OXYDENDRUM*.  
 Corolla campanulate; anthers fixed nearly at the apex. 22. *CASSIOPE*.  
 Style slender; corolla-lobes much shorter than the tube; leaf-blades broad.  
 Style ovoid or conic; corolla-lobes as long as the tube or longer; leaf-blades narrow. 23. *HARRIMANELLA*.  
 Calyx-lobes valvate or separated in the bud.  
 Anther-sacs awned; capsule-sutures not thickened.  
 Awns of the anther-sacs ascending; seeds smooth and shining.  
 Corolla urceolate; anthers oval; filaments scarcely dilated at the base. 24. *ANDROMEDA*.  
 Corolla campanulate; anthers narrow; filaments abruptly much-dilated at the base. 25. *ZENOBIA*.  
 Awns of the anther-sacs deflexed; seeds reticulate or with a loose coat.  
 Flowers in terminal compound panicles; filaments subulate, straight or nearly so. 26. *PIERIS*.  
 Flowers in axillary simple raceme-like panicles; filaments much flattened, linear-lanceolate to lanceolate, sigmoid-curved. 27. *AMPELOTHAMNUS*.  
 Anther-sacs awnless; capsule-sutures thickened.  
 Filaments appendaged.  
 Style fusiform; corolla of an urceolate type; leaf-blades with intra-marginal veins; sepals persistent. 28. *DESMOTHAMNUS*.  
 Style columnar; corolla of a campanulate type; leaf-blades without intramarginal veins; sepals deciduous. 29. *NEOPIERIS*.  
 Filaments unappendaged.  
 Capsule longer than thick, prominently angled; lepidote shrubs with persistent leaves; flowers in axillary clusters. 30. *XOLISMA*.



- Capsule depressed, not angled; pubescent shrubs with deciduous leaves: flowers in paniced racemes.
- Anther-sacs opening lengthwise; capsule marginicidal.
- Calyx accrescent and enclosing the capsule.
- Capsule enclosed in the persistent corolla; calyx not accrescent.
- Corolla longer than the calyx, the lobes shorter than the tube.
- Corolla shorter than the calyx, the lobes longer than the tube.
- Ovary ripening into a berry or a drupe.
- Cavities of the ovary many-ovuled; fruit a berry.
- Berry smooth; panicles 1-few-flowered near the tip of the branches, inconspicuous.
- Berry granular-papillose; panicles several-flowered, more or less elongate, often clustered.
- Cavities of the ovary 1-ovuled; fruit a drupe.
- Leaves persistent and evergreen, the blades thick; drupes dry, mealy, or fleshy.
- Drupe papillose or warty, fleshy, the stone of few firmly united carpels.
- Drupe smooth, glabrous or pubescent, not fleshy, the stone of separate or irregularly coalescent nutlets, or sometimes of several firmly united carpels.
- Panicles simple, single or clustered; carpels (nutlets) 1-celled; leaves alternate.
- Leaves not vertical, the blades revolute; bark grayish-brown, persistent or very tardily exfoliating; filaments filiform or slightly dilated near the base; carpels united into a woody 3-5-celled stone.
- Leaves often vertical and similar on both surfaces, the blades flat or very slightly revolute; bark reddish-brown, readily exfoliating; filaments much dilated; carpels separate or more or less coalescent, or rarely united.
- Panicles compound, much-branched throughout; carpels (nutlets) 2-celled by a partition from the inner angle; leaves opposite or whorled.
- Leaves marcescent, the blades thin; drupes juicy.
31. ARSENOCOCCUS.
32. EPIGAEA.
33. GAULTHERIA.
34. ERICA.
35. CALLUNA.
36. PERNETTIA.
37. ARBUTUS.
38. COMAROSTAPHYLIS.
39. XYLOCOCCUS.
40. UVA-URSI.
41. ORNITHOSTAPHYLOS.
42. ARCTOUS.

# 1. BEFARIA\* Mutis; L. Mant. 152, 242. 1771.

*Jurgensenia* Turcz. Bull. Soc. Nat. Mosc. 20<sup>1</sup>: 151. 1847.

Shrubs with erect, usually much-branched stems, the branches usually with fine pubescence or scurf, and also hirsute or hispid hairs. Leaves alternate, often numerous, sometimes crowded; blades narrow<sup>1</sup> or broad, thick, entire, often glaucous, sessile or short-petioled. Flowers perfect, in terminal panicles, usually viscid. Calyx campanulate; lobes 6 or 7, short and broad, as long as the tube or shorter. Corolla white or colored, often pink, yellowish, or red; petals ascending or spreading, narrow, unequal, many times as long as the calyx. Stamens erect or ascending, as long as the petals or shorter; filaments slender, glabrous or pubescent; anthers much shorter than the filaments, oblong or oval. Ovary 6- or 7-celled, lobed, depressed; style elongate, curved, scarcely enlarged under the stigma; stigma discoid. Capsule depressed, shallowly 6- or 7-lobed, 6- or 7-valved, septicidal.

Type species, *Befaria aestuans* L.

Leaf-blades linear or nearly linear, strongly revolute.

1. *B. cubensis*.

Leaf-blades broader, not revolute.

Petals less than 3 cm. long.

Branches glabrous or nearly so; leaf-blades acuminate.

2. *B. laevis*.

Branches pubescent; leaf-blades obtuse, acute, or mucronate.

Flower-stalks longer than the petals; capsules much depressed.

3. *B. discolor*.

Flower-stalks shorter than the petals; capsules slightly depressed.

4. *B. racemosa*.

Petals more than 3 cm. long.

5. *B. mexicana*.

# 1. *Befaria cubensis* Griseb. Cat. Pl. Cub. 52. 1866.

Shrub with scurfy and viscid-hirsute branches; leaves numerous and usually crowded, the blades linear or nearly linear, 2-7 cm. long, acute or acutish, bright-green and glabrous above, glaucous and glabrous beneath, except the stout midrib, narrowed at the base but sessile; flowers long-peduncled, the peduncles with thick narrow scales below the middle;

\* Spelling corrected to *Bejaria* by Ventenat (Descr. Pl. Cels *pl.* 51. 1802), upon the supposition that Mutis intended to name the genus in honor of his friend Bejar; *Bejaria* is here treated as a mere variant spelling.

calyx-lobes ovate to deltoid; petals deep-red, spatulate or oblong-spatulate, 1.5–2 cm. long; filaments glabrous; style slender; capsules much depressed, 5–7 mm. wide, depressed at the style-base.

TYPE LOCALITY: Western Cuba.

DISTRIBUTION: Pinar del Rio, Cuba.

## 2. *Befaria laevis* Benth. Pl. Hartw. 65. 1840.

*Befaria glabra* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 543. 1842.

Shrub with glabrous or nearly glabrous branches; leaves not crowded, the blades lanceolate to linear-lanceolate, 3–8 cm. long, somewhat acuminate, bright-green and slightly shining above, rather dull beneath, glabrous or nearly so, short-petioled; flowers on rather slender slightly scurfy peduncles; calyx-lobes ovate to reniform-ovate, obtuse; petals spatulate to oblong-spatulate, 12–18 mm. long; filaments minutely pubescent near the slightly dilated bases; anthers about 1.5 mm. long; style stoutish; capsules not seen.

TYPE LOCALITY: Tabaa ["Talea"], Oaxaca.

DISTRIBUTION: Known only from the type locality.

## 3. *Befaria discolor* Benth. Pl. Hartw. 65. 1840.

*Befaria floribunda* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 543. 1842.

*Jurgensenia mexicana* Turcz. Bull. Soc. Nat. Mosc. 20<sup>1</sup>: 151. 1847.

Shrub with glandular-hispid branches; leaves not crowded, the blades ovate or elliptic to oval, 2.5–5 cm. long, obtuse or abruptly pointed, shining and glabrous above, glaucous and slightly pubescent, especially on the midrib beneath, short-petioled; flowers on stoutish hispid peduncles; calyx-lobes ovate to deltoid-ovate, obtuse; petals spatulate, 14–19 mm. long; filaments pubescent at the slightly dilated bases; anthers about 2 mm. long; style stout; capsules much depressed, 6–7 mm. wide.

TYPE LOCALITY: Tabaa ["Talea"], Oaxaca.

DISTRIBUTION: Oaxaca.

## 4. *Befaria racemosa* Vent. Descr. Pl. Cels *pl.* 51. 1802.

*Befaria paniculata* Michx. Fl. Bor. Am. 1: 280. 1803.

Shrub with puberulent and more or less hispid branches; leaves rather numerous, but not crowded, the blades oblong, elliptic, or oval, varying to broadest above the middle or below it, 1.5–4 cm. long, acute or obtuse, glabrous, lustrous above, dull and paler-green beneath, sometimes glaucescent, short-petioled, or narrowed to the sessile base; flowers short-peduncled, the peduncles with broad scales above the middle; calyx-lobes broadly ovate to deltoid-reniform; petals white or pink, spatulate or linear-spatulate, 2–2.5 cm. long; filaments pubescent; style stout; capsules slightly depressed, 7–9 mm. wide, abruptly narrowed into the style-base.

TYPE LOCALITY: Florida.

DISTRIBUTION: Southeastern Georgia and Florida.

ILLUSTRATIONS: Vent. Descr. Pl. Cels *pl.* 51; Michx. Fl. Bor. Am. *pl.* 26.

## 5. *Befaria mexicana* Benth. Pl. Hartw. 15. 1839.

Shrub with scurfy-hirsutulous branches; leaves numerous, the blades oblong to oblong-lanceolate, 1–3 cm. long, acute or mucronate, sparingly pubescent, bright-green and somewhat shining above, glaucous beneath, short-petioled; flowers on long stout peduncles, the peduncles densely reddish-pubescent; calyx-lobes ovate to ovate-lanceolate, obtuse; petals oblong-spatulate, 3–4 cm. long; anthers 2.5–3 mm. long; style stout; capsules not seen.

TYPE LOCALITY: [Zacatecas,] Mexico.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Seem. Bot. Voy. Herald *pl.* 57.

## 2. *LEDUM* L. Sp. Pl. 391. 1753.

Shrubs with tall or diffuse and depressed stems. Leaves alternate; blades thick, broad or narrow, entire, often strongly revolute, tomentose or resinous-granuliferous beneath, petioled.



Flowers perfect, in corymb-like or umbel-like clusters from scaly buds. Calyx saucer-shaped; lobes 5, broad, short, often as wide as long. Corolla white; petals 5, spreading, broad, ovate, oval, or obovate, or sometimes oblong, equal or nearly so. Stamens 5–10, erect or ascending; filaments filiform or slender-subulate; anthers oblong to oval, much shorter than the filaments. Ovary 5-celled, slightly elongate, obscurely lobed; style elongate, nearly straight, slightly enlarged at the apex; stigma obscurely annulate. Capsule longer than thick or subglobose, shallowly lobed, 5-valved from the base to the apex, septicidal.

Type species, *Ledum palustre* L.

Leaf-blades tomentose beneath, strongly revolute.

Stamens 5–7; capsules mostly oblong.

Stamens 10; capsules oval to ovoid or obovoid.

Style several times longer than the ovary; leaf-blades broad.

Style about as long as the ovary; leaf-blades narrow.

Leaf-blades resinous-granuliferous beneath, flat or slightly revolute.

Capsules subglobose; calyx-lobes ciliolate and ciliate.

Capsules oblong; calyx-lobes merely ciliolate.

1. *L. groenlandicum*.

2. *L. pacificum*.

3. *L. decumbens*.

4. *L. glandulosum*.

5. *L. columbianum*.

### 1. *Ledum groenlandicum* Oeder, Fl. Dan. 4<sup>10</sup>: 5. 1777.

*Ledum latifolium* Ait. Hort. Kew. 2: 65. 1789.

*Ledum palustre latifolium* Michx. Fl. Bor. Am. 1: 259. 1803.

*Ledum canadense* Lodd. Bot. Cab. pl. 1049. 1825.

An erect shrub with loosely pubescent twigs; leaf-blades oblong, elliptic, or oval, or sometimes apparently narrower on account of the strongly revolute margins, 2–6 cm. long, obtuse, glabrous or nearly so above, felty-tomentose beneath, short-petioled; pedicels minutely pubescent; calyx-lobes broadly deltoid, acute or acutish; petals oblong or ovate-oblong, 5–8 mm. long; stamens 5–7; filaments mostly glabrous; capsules oblong, 5–6.5 mm. long, usually about twice as long as thick.

TYPE LOCALITY: Greenland.

DISTRIBUTION: Greenland, Labrador, and Newfoundland to Alaska, Pennsylvania, Wisconsin, Alberta, and Washington.

ILLUSTRATIONS: Fl. Dan. pl. 567; Meerberg, Pl. Sel. pl. 20; Lam. Tab. Encyc. pl. 363, f. 1; Jacq. Ic. Rar. pl. 464; Nouv. Duham. 4: pl. 27; Bot. Cab. pl. 534, 1049; Henshaw, Mountain Fl. Am. pl. 96; Brown & Schäffer, Alp. Pl. Can. pl. 60; Britt. & Brown, Ill. Fl. f. 2742; ed. 2. f. 3214.

### 2. *Ledum pacificum* Small, sp. nov.

*Ledum palustre dilatatum* A. Gray, Syn. Fl. 2<sup>1</sup>: 43. 1878. Not *L. palustre dilatatum* Wahl. 1812.

An erect shrub with loosely pubescent twigs; leaf-blades oblong, elliptic, or oblong-lanceolate, 1.5–4 cm. long, more or less revolute, obtuse or acutish, ultimately glabrous above, copiously tomentose beneath, short-petioled; pedicels puberulent; calyx-lobes deltoid, obtuse; petals oblong to oval, 5–6.5 mm. long; stamens 10; filaments pubescent below the middle; capsules oval or subglobose, 4.5–5.5 mm. long, slightly longer than thick.

Type collected on Sitka, *Tiling* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Sitka; also in Japan.

### 3. *Ledum decumbens* (Ait.) Lodd.; Steud. Nom. Bot.

ed. 2. 2: 20. 1841.

*Ledum palustre decumbens* Ait. Hort. Kew. 2: 65. 1789.

*Ledum palustre angustifolium* Hook. Fl. Bor. Am. 2: 44. 1834.

A diffuse, usually depressed shrub with tomentulose twigs; leaf-blades narrowly oblong to linear, strongly revolute and often narrowly linear on account of the revolute margins, 1–1.5 cm. long or less, obtuse, glabrous, at least ultimately, above, tomentulose beneath, very short-petioled; pedicels tomentulose; calyx-lobes broadly ovate to half orbicular, obtuse; petals oval or ovate-oval, 6–7 mm. long; stamens 10; filaments pubescent below the middle; capsules oval or obovoid, 3–4 mm. long, somewhat longer than thick.

TYPE LOCALITY: Hudson Bay.

DISTRIBUTION: Greenland and Arctic America to Labrador, Alaska, and eastern Siberia.

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2. f. 3213.

4. *Ledum glandulosum* Nutt. Trans. Am. Phil. Soc. II. 8: 270. 1843.

?*Ledum californicum* Kellogg, Proc. Calif. Acad. 2: 14. 1863.

An erect shrub with puberulent twigs; leaf-blades oblong, elliptic, or oval, varying to ovate or obovate, 1.5–5 cm. long, not revolute, pale and resinous-glanduliferous beneath, minutely rugose above in age, longer-petioled than those of any of the preceding species; flower-clusters terminal and also lateral, with concave finely pubescent bracts; pedicels slender, minutely pubescent; calyx-lobes ovate to oblong, obtuse; petals suborbicular, ovate, or oblong, 5–8 mm. long; stamens 10; filaments pubescent near the base; capsules subglobose, 4–5 mm. in diameter.

TYPE LOCALITY: Rocky mountains.

DISTRIBUTION: Alberta and British Columbia to Wyoming and California.

ILLUSTRATION: Bot. Mag. pl. 7610.

5. *Ledum columbianum* Piper, Contr. U. S. Nat. Herb. 11: 441. 1906.

An erect shrub with puberulent and sometimes slightly pubescent twigs; leaf-blades oblong, elliptic, or oblong-ovate, 4–6 cm. long, revolute, white or whitish and resinous-granuliferous beneath, finely reticulate, relatively long-petioled; flower-clusters terminal, with somewhat crescent-shaped, usually glabrous, bracts; pedicels slender, closely puberulent; calyx-lobes broadly ovate or orbicular-ovate, obtuse; petals white, oval, 5–7 mm. long; stamens 5–7, or rarely more; filaments pubescent below the middle; capsules oblong, 5–6 mm. long.

TYPE LOCALITY: Ilwaco, Washington.

DISTRIBUTION: Washington and Oregon.

3. *DENDRIUM* Desv. Jour. Bot. Desv. II. 1: 36. 1813.

~~*Leiophyllum* Pers. Syn. Pl. 1: 477. 1805.~~ | Not *Leiophyllum* Ehrh. 1780.

~~*Ammyrsine* Pursh, Fl. Am. Sept. 301. 1814.~~

~~*Fischeria* Sw. Mém. Soc. Nat. Mosc. 5: 14. 1817.~~

← No descrip.

Shrubs with low or depressed often matted branches. Leaves alternate or opposite, approximate or crowded, persistent; blades broad, leathery, entire, shining above, manifestly short-petioled. Flowers in terminal umbel-like corymbs, erect, slender-pedicelled. Calyx persistent; lobes 5, narrow, much longer than the flattish base. Corolla rotate, white or pink; petals broad or relatively so, spreading, equal or nearly so, sessile. Stamens 10 or rarely 8, conspicuously exerted, as long as the petals or longer; filaments filiform, not declined, glabrous; anthers globular-didymous, opening lengthwise, colored, mostly brown or purple. Ovary 2- or 3-celled, or rarely 5-celled, seated on a disk, very short; style straight, slender, columnar or clavate; stigma minute. Capsule of an ovoid type, seated in the partly clasping calyx, 2- or 3-valved from the apex or rarely 5-valved.

Type species, *Ledum buxifolium* Berg.

Style slender, fully twice or thrice as long as the ovary in anthesis; disk minute; petals oblong to ovate-oblong; pedicels glabrous.

Style stout, less than twice as long as the ovary; disk prominent; petals ovate to rhombic-ovate or oval; pedicels pubescent.

Leaves mostly opposite; capsule-valves sharp-tuberculate; depressed or diffuse shrub.

Leaves alternate; capsule-valves muricate or scabrous; erect shrub.

1. *D. buxifolium*.

2. *D. Lyoni*.

3. *D. Hugeri*.

1. *Dendrium buxifolium* (Berg.) Desv. Jour. Bot.

Desv. II. 1: 36. 1813.

*Ledum buxifolium* Berg. Acta Acad. Petrop. 1: 213. 1778.

*Ammyrsine buxifolia* Pursh, Fl. Am. Sept. 301. 1814.

*Fischeria buxifolia* Sw. Mém. Soc. Nat. Mosc. 5: 14. 1817.

*Leiophyllum buxifolium* Ell. Bot. S. C. & Ga. 1: 483. 1817.

*Ledum thymifolium* Lam. Encyc. 3: 459. 1791.

*Leiophyllum thymifolium* G. Don, Gen. Hist. 3: 851. 1834.

*Leiophyllum serpyllifolium* DC. Prodr. 7: 730. 1839.

An erect much-branched shrub resembling dwarf-box, 5 dm. tall or less, glabrous throughout; leaves mainly alternate, the blades oblong or slightly broadened upward, 3–8 mm. long or rarely longer, deep-green and shining above, paler and dull beneath, short-petioled; pedicels glabrous; calyx-lobes oblong-lanceolate to lanceolate, about 1 mm. long, obtusish or acutish



in age; petals oblong to ovate-oblong, 2–2.5 mm. long; capsules ovoid, about 3 mm. long, glabrous, more than twice as long as the calyx.

TYPE LOCALITY: North America.

DISTRIBUTION: Coastal plain, New Jersey; also recorded from as far south as Florida, but no specimens have been seen from south of New Jersey.

ILLUSTRATIONS: Lam. Tab. Encyc. *pl.* 363; Bot. Cab. *pl.* 52; Herb. Gén. Amat. *pl.* 242; Britt. & Brown, Ill. Fl. *f.* 2754; ed. 2. *f.* 3226; Goodale, Wild Fl. Am. *pl.* 49; Bot. Reg. 7: *pl.* 531.

## 2. *Dendrium Lyoni* (Sweet) Small.

*Ammyrsine Lyoni* Sweet, Hort. Brit. 344. 1830.

*Ammyrsine prostrata* Loud. Hort. Brit. 477. 1832.

*Leiophyllum prostratum* Loud. Arb. 1155. 1839.

*Leiophyllum Lyoni* Sweet, Hort. Brit. ed. 3. 444. 1839.

*Leiophyllum buxifolium prostratum* A. Gray, Am. Jour. Sci. 42: 36. 1842.

*Dendrium buxifolium prostratum* Ashe, Bot. Gaz. 24: 377. 1897.

*Dendrium prostratum* Small, Fl. SE. U. S. 882. 1903.

A diffuse or depressed copiously branched shrub with often matted branches, nearly glabrous, 2 dm. tall or less; leaves mostly opposite, the blades oval or broadly oblong, 4–7 mm. long or smaller, dark-green and shining above, paler and dull beneath, short-petioled; pedicels pubescent, more or less glandular; calyx-lobes lanceolate to linear, about 1.5 mm. long, acute or obtusish; petals ovate or oval, 2.5 mm. long; capsules broadly ovoid to globose-ovoid, 2.5–3 mm. long, sharp-tuberculate on the back.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Mountain summits, North Carolina and Tennessee.

ILLUSTRATION: Lounsberry, S. Wild Fl. *pl.* 122.

## 3. *Dendrium Hugerii* Small, Bull. Torrey Club 28: 360. 1901.

An erect much-branched shrub 9 dm. tall or less, nearly glabrous to the inflorescence; leaves alternate, the blades oblong or individually oblong-ovate, 9–15 mm. long, dark-green and shining above, paler and dull beneath, short-petioled; pedicels pubescent and minutely glandular; calyx-lobes lanceolate, 2 mm. long or sometimes shorter, acute; petals broadly ovate or rhombic-ovate, 3.5–4 mm. long; capsules ovoid, 3.5–4 mm. long, muricate or scabrous on the back.

TYPE LOCALITY: Top of Table Mountain, South Carolina.

DISTRIBUTION: Mountain, North Carolina and South Carolina.

## 4. *ELLIOTTIA* Muhl.; Ell. Bot. S. C. & Ga. 1: 448. 1817.

Shrubs with erect branching stems. Leaves alternate; blades broad or sometimes narrow, thickish and firm in age, entire, with alternate lateral veins, petioled. Flowers perfect, in terminal elongate racemes or panicles. Calyx saucer-shaped; lobes 3–5, usually 4, broad and short, about as long as the tube. Corolla white or pink; petals recurved, narrow, elongate, unequal. Stamens 8, nearly erect, shorter than the petals; filaments subulate; anthers much shorter than the filaments, sagittate. Ovary 3–5-celled, lobed, depressed; style elongate, curved, enlarged near the apex; stigma lobed. Capsule depressed, shallowly 3–5-lobed, 3–5-valved, septicidal.

Type species, *Elliottia racemosa* Muhl.

### 1. *Elliottia racemosa* Muhl.; Ell. Bot. S. C. & Ga. 1: 448. 1817.

Shrub 3 m. tall or less, with glabrous or obscurely pubescent twigs; leaf-blades oblong, elliptic, oval, oblong-oblongate, or obovate, 4–14 cm. long, acuminate at both ends or abruptly pointed at the apex, minutely bristle-tipped, glabrous or loosely fine-pubescent beneath, shining above and somewhat reticulate beneath in age; racemes or panicles erect, many-flowered; buds nodding; flowers spreading, slender-pedicelled; calyx 3–4 mm. broad, the lobes broadly triangular to reniform, often ciliate; petals broadly linear, linear-oblong, or slightly dilated near the apex, 9–15 mm. long; stamens 6–8 mm. long; style 11–17 mm. long; capsules spheroidal or somewhat ovoid, about 5 mm. wide.

TYPE LOCALITY: Waynesboro, Georgia.

DISTRIBUTION: Eastern Georgia and adjacent South Carolina.

ILLUSTRATIONS: Garden & Forest 7: *f.* 37; Sarg. Silva *pl.* 712; Sarg. Man. *f.* 581; Britton, N. Am. Trees *f.* 686; Ann. N. Y. Acad. 17: *pl.* 19, *f.* 2; *pl.* 20; Lounsberry, S. Wild Fl. *pl.* 124.

## 5. CLADOTHAMNUS Bong. Mém. Acad. St.-Pétersb.

VI. 2: 155. 1832.

*Tolmiea* Hook. Fl. Bor. Am 2: 44. 1834.

Shrubs with erect branching stems. Leaves alternate, often approximate on twigs; blades relatively narrow, thinnish, entire, with obscure alternate lateral veins, petioled. Flowers perfect, solitary in the leaf-axils or few together in corymb-like clusters. Calyx rotate; lobes 5, narrow, many times longer than the tube. Corolla red or salmon-colored; petals narrow, sometimes slightly broadest above the middle or below it, mostly spreading in anthesis. Stamens 10, ascending or spreading, shorter than the petals; filaments subulate or lanceolate; anthers oblong or oval, much shorter than the filaments. Ovary 5- or 6-celled, lobed, depressed; style elongate, declined and strongly curved, enlarged at the apex; stigma capitate-discoïd, somewhat lobed. Capsule depressed, 5- or 6-lobed, 5- or 6-valved, septicidal.

Type species, *Cladothamnus pyrolaeiflorus* Bong.

### 1. *Cladothamnus pyrolaeiflorus* Bong. Mém. Acad.

St.-Pétersb. VI. 2: 155. 1832.

*Tolmiea occidentalis* Hook. Fl. Bor. Am. 2: 44. 1834.

A shrub with glabrous or puberulent angled twigs; leaf-blades spatulate to oblong, 1-4 cm. long, rounded or abruptly short-pointed, glabrous or ciliolate, at least when young, much paler-green beneath than above, obscurely veined; flowers erect or ascending from drooping buds, slender-pedicelled; calyx about 2 cm. broad, the lobes linear or nearly so, often ciliolate, especially near the base; petals oblong to oblong-spatulate, 11-15 mm. long; stamens 7-9 mm. long; style about 10 mm. long; capsules spheroidal, 6-8 mm. wide.

TYPE LOCALITY: Sitka.

DISTRIBUTION: Alaska to British Columbia and Oregon.

ILLUSTRATIONS: Mém. Acad. St.-Pétersb. VI. 2: *pl.* 1; Garden & Forest 10: *f.* 27.

## 6. LOISELEURIA Desv. Jour. Bot. Desv. II. 1: 35. 1813.

*Chamaecistus* S. F. Gray, Nat. Arr. Brit. Pl. 2: 401. 1821.

*Chamaeledon* Link, Enum. 1: 210. 1821.

Shrubs with low often prostrate branches. Leaves opposite or sometimes alternate, usually approximate or crowded; blades thick-leathery, entire, revolute, with a very thick midrib, petioled. Flowers few together in terminal umbel-like clusters, short-pedicelled. Calyx persistent; lobes 5, rather narrow, much longer than the tube. Corolla broadly campanulate, white to deep-pink, deciduous; lobes relatively broad, about as long as the tube, somewhat spreading. Stamens 5, included, much shorter than the corolla; filaments subulate, glabrous; anthers globular-didymous, opening lengthwise, often purplish. Ovary 2- or 3-celled, seated on a disk; style short, columnar; stigma truncate or obscurely lobed. Capsule of an ovoid or conic type, clasped by the calyx, 2- or 3-valved from the apex, the valves ultimately cleft.

Type species, *Azalea procumbens* L.

### 1. *Loiseleuria procumbens* (L.) Desv. Jour. Bot.

Desv. II. 1: 35. 1813.

*Azalea procumbens* L. Sp. Pl. 151. 1753.

*Chamaecistus serpyllifolia* S. F. Gray, Nat. Arr. Brit. Pl. 2: 401. 1821.

*Chamaeledon procumbens* Link, Enum. 1: 211. 1821.

*Chamaecistus procumbens* Kuntze, Rev. Gen. 388. 1891.

A depressed shrub with more or less matted branches, seldom more than 2 dm. tall; leaves mostly opposite, numerous, the blades very thick, oblong to oval, 3-8 mm. long, obtuse, revolute, very prominently 1-ribbed beneath, glabrous, often glaucous beneath along the midrib, stout-petioled; pedicels glabrous, 3-10 mm. long; calyx-lobes oblong to oblong-lanceolate, 2-3 mm. long; corolla 4-5 mm. long; lobes ovate, obtuse; stamens 2-3 mm. long; capsules ovoid or ovoid-conic, 3-4 mm. long, abruptly pointed, glabrous.

TYPE LOCALITY: Alps.



DISTRIBUTION: Greenland, Arctic America, and Alaska to Newfoundland and the White Mountains, New Hampshire; also in Europe and Asia.

ILLUSTRATIONS: L. Fl. Lapp. *pl.* 6; Pall. Fl. Ross. *pl.* 70; Fl. Dan. *pl.* 9; Gaertn. Fruct. *pl.* 63; Nouv. Duham. 5: *pl.* 65; Schkuhr, Handb. *pl.* 36; Lam. Tab. Encyc. *pl.* 110; Engl. Bot. 13: *pl.* 865; Bot. Cab. *pl.* 762; Baxter, Brit. Bot. 6: *pl.* 463; Britt. & Brown, Ill. Fl. *f.* 2755; ed. 2. *f.* 3227.

## 7. AZALEA L. Sp. Pl. 150. 1753.

Shrubs or small trees, with glabrous or variously pubescent foliage and deciduous or caducous bud-scales. Leaves alternate, remote or sometimes approximate at the ends of the branches, deciduous; blades mostly broad, thin or thickish, entire or obscurely toothed, ciliate, gland-tipped, petioled. Flowers in clusters terminating the branches, sooner or later surrounded by the leaf-clusters or leafy branches. Calyx flat or saucer-shaped, small; lobes 5, very short or occasionally somewhat elongate, persistent. Corolla white, pale, or highly-colored, funnelform; tube elongate, gradually or abruptly dilated into the limb; lobes 5, usually longer than the limb-body, unequal, often undulate or crisped, spreading or recurved. Stamens 5 or 10, much exserted; filaments very slender, declined; anthers oblong or oval. Ovary 5-celled, shallowly lobed, usually strigose, slightly elongate; style declined greatly elongate, slightly enlarged at the apex; stigma discoid-capitate. Capsule narrow, oblong to linear, or gradually narrowed to the apex, rather thick-walled.

Type species, *Azalea indica* L.

Flower-clusters appearing before the leaves, or as the leaves unfold.

Corolla red, orange, or yellow.

Bud-scales glabrous on the black; leaf-blades shining and glabrous above, except the midrib; capsule strigose-hirsute.

Bud-scales silky on the back; leaf-blades finely reticulate and minutely pubescent above; capsule glandular-pubescent.

Corolla pink, white, or purplish.

Corolla-tube hirsute or strigose.

Corolla-tube glandular-pubescent.

Leaf-blades reticulate; capsule finely canescent and hirsute.

Leaf-blades thin, not reticulate; capsule glandular-pubescent.

Flower-clusters appearing after the leaves.

Plants of the Atlantic States; calyx-lobes coarsely ciliate.

Style pubescent, at least near the base.

Leaf-blades permanently white or pale-tomentose beneath; capsule pale-canescens.

Leaf-blades with scattered appressed hairs, sometimes only on the midrib; capsule, as far as known, hirsute.

Leaf-blades predominatingly of an obovate, cuneate, or oblong-ob lanceolate type.

Calyx-lobes short, ovate or rarely oblong-ovate; young leaf-blades not strigillose.

Calyx-lobes long, lanceolate; young leaf-blades strigillose.

Leaf-blades predominatingly of an oblong or oval type.

Style glabrous.

Calyx-lobes oblong to lanceolate, ciliate with gland-tipped hairs; corolla more than 3 cm. long, white or pink.

Calyx-lobes ovate to half-orbicular, ciliate with glandless hairs; corolla less than 3 cm. long, crimson.

Plant of the Pacific slope; calyx-lobes finely ciliate.

1. *A. lutea*.

2. *A. austrina*.

3. *A. nudiflora*.

4. *A. canescens*.

5. *A. prinophylla*.

6. *A. candida*.

7. *A. viscosa*.

8. *A. oblongifolia*.

9. *A. serrulata*.

10. *A. arborescens*.

11. *A. prunifolia*.

12. *A. californica*.

## 1. *Azalea lutea* L. Sp. Pl. 150. 1753.

*Azalea calendulacea* Michx. Fl. Bor. Am. 1: 151. 1803. ✓

*Rhododendron calendulaceum* Torr. Fl. U. S. 425. 1824.

*Rhododendron luteum* C. K. Schneider, Handb. Laubh. 2: 500. 1911. Not *R. luteum* Sweet, 1830.

A shrub 5 m. tall or less, with erect or spreading branches and finely loose-pubescent twigs; leaf-blades oval, elliptic, or obovate, 3–8 cm. long or more, abruptly gland-tipped, ciliate, with scattered hairs beneath, at least when young, and pubescent on the midrib (or sometimes canescent beneath, probably hybrids with *A. prinophylla*), short-petioled; flower-clusters expanding with the leaves; pedicels pubescent, sometimes glandular; calyx-lobes ovate to oblong, long-ciliate, obtuse; corolla yellow to red, or variegated, 2.5–3.5 cm. long, the tube gradually dilated upward, glandular-pubescent, the lobes broad, abruptly short-pointed; anthers 2.5–3 mm. long; capsules oblong or ovoid-oblong, 1.5–2 cm. long or rarely more, pubescent.

TYPE LOCALITY: On the Savannah River.

DISTRIBUTION: Southern New York and Pennsylvania, in and near the mountains to northern Georgia.

ILLUSTRATIONS: Bot. Mag. *pl.* 1721, 2143; Britt. & Brown, Ill. Fl. *f.* 2745; ed. 2. *f.* 3217.



2. *Azalea austrina* Small, Fl. SE. U. S. ed. 2. 1356. 1913.

A shrub mostly 3 m. tall or less, with irregular branches and softly pubescent and usually glandular twigs; leaf-blades oval, obovate, oblong, or oblong-spatulate, 2.5–9 cm. long, acute or abruptly gland-tipped, rather firm in age, finely pubescent, usually permanently so, ciliate, short-petioled; flower-clusters expanding before the leaves; pedicels glandular-pubescent; calyx-lobes deltoid to triangular-lanceolate, acute, glandular-ciliate; corolla yellow or orange, 2–3 cm. long, the tube scarcely dilated up to the limb, finely glandular-pubescent, the lobes broad, acute or abruptly short-acuminate; anthers 2.5–3 mm. long; capsules rather slender, slightly narrowed upward, 2–2.5 cm. long, finely glandular-pubescent.

TYPE LOCALITY: Chattahoochee, Florida.

DISTRIBUTION: Chattahoochee region, middle Florida.

3. *Azalea nudiflora* L. Sp. Pl. ed. 2. 214. 1762.

*Azalea periclymenoides* Michx. Fl. Bor. Am. 1: 151. 1803.

?*Azalea bicolor* Pursh, Fl. Am. Sept. 153. 1814.

*Rhododendron nudiflorum* Torr. Fl. U. S. 424. 1824.

?*Rhododendron bicolor* G. Don, Gen. Hist. 3: 847. 1834.

A shrub 3 m. tall or less, with irregularly branched stems and minutely pubescent and more or less strigose twigs; leaf-blades oblong to obovate or oblong-obovate, 3–10 cm. long, thick and firm in age, acute or abruptly gland-tipped, strigose on or near the veins beneath or glabrous, except the margins, short-petioled; flower-clusters expanding before or with the leaves; pedicels strigose or hirsute-strigose; calyx-lobes ovate to half-orbicular, copiously ciliate; corolla pink or white, or purplish, 2.5–3.5 cm. long, the tube gradually dilated above the middle, pilose or strigose, and sometimes sparingly glandular, the lobes rather broad, abruptly pointed; anthers 2.5–3 mm. long; capsules oblong, linear-oblong, or somewhat narrowed upward, strigose or hirsute-strigose.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Maine to Illinois, Florida, and Texas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2743; ed. 2. f. 3215.

4. *Azalea canescens* Michx. Fl. Bor. Am. 1: 150. 1803.

*Rhododendron canescens* G. Don, Gen. Hist. 3: 848. 1834.

A shrub 4 m. tall or less, with diffuse or spreading branches and minutely soft-pubescent and usually also strigose twigs; leaf-blades elliptic, elliptic-oblong, oblong, or narrowly obovate, thickish and firm at maturity, 4–10 cm. long, acute and gland-tipped or sometimes abruptly pointed, ciliate with scattered hairs above or nearly glabrous, permanently tomentose-canescens beneath, short-petioled; flower-clusters expanding before the leaves or appearing with the earlier leaves; pedicels canescent and more or less hirsute; calyx-lobes deltoid to ovate, ciliate; corolla pink, rose, or rarely white, 1.5–2 cm. long, or rarely somewhat longer, the tube finely glandular-pubescent, abruptly dilated near the throat, the lobes acute; anthers 1.5–2 mm. long; capsules slender, narrowed upward, 1.5–3 cm. long, canescent and hirsute.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: North Carolina to Florida and Louisiana.

5. *Azalea prinophylla* Small, sp. nov.

*Rhododendron canescens* Porter, Bull. Torrey Club 16: 220. 1889. Not *Azalea canescens* Michx.

A shrub 5 m. tall or less, with irregularly branched stems and finely loose-pubescent twigs; leaf-blades oval or elliptic, varying to obovate, 2–8 cm. long, thinnish and not very firm at maturity, acute or short-acuminate and gland-tipped, ciliate, canescent beneath or glabrate, especially in age, short-petioled; flower-clusters expanding before or with the leaves; pedicels glandular-pubescent; calyx-lobes half-orbicular to deltoid, sparingly-ciliate, obtuse; corolla deep-pink to whitish, 2–2.5 cm. long, the tube glandular-pubescent, dilated upward, the lobes rather broad, abruptly pointed; anthers 2–2.5 mm. long; capsules oblong to ovoid-oblong, 1.5–2.5 cm. long, or smaller, glandular-pubescent.

Type collected at Pocono Summit, Monroe County, Pennsylvania, May 22 (in flower) September 4 (in fruit), 1889, T. C. Porter (herb. Columbia Univ.).

DISTRIBUTION: Massachusetts, Vermont, and New York to the mountains of Virginia and Tennessee.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2744; ed. 2. f. 3216 (as *A. canescens*).



6. *Azalea candida* Small, Bull. Torrey Club 28: 360. 1901.

A shrub 2 m. tall or less, with widely branched stems and tomentulose and often somewhat glandular twigs; leaf-blades obovate, obovate-oblongate, cuneate, or oblong, leathery at maturity, 1–7 cm. long, acute or abruptly gland-tipped, thinly fine-pubescent above, white or pale-tomentose beneath and sometimes reticulate-veiny, short-petioled; flower-clusters expanding after the leaves; pedicels glandular-pubescent; calyx-lobes deltoid, ciliate, obtuse; corolla white or pinkish; anthers 2.5–3 mm. long; capsules narrow, gradually narrowed upward, 2–2.5 cm. long, canescent, curved.

TYPE LOCALITY: Southern Georgia.

DISTRIBUTION: Georgia and Florida.

7. *Azalea viscosa* L. Sp. Pl. 151. 1753.

*Azalea viscosa glauca* Michx. Fl. Bor. Am. 1: 151. 1803. ←

*Azalea nitida* Pursh, Fl. Am. Sept. 153. 1814. ←

*Azalea hispida* Pursh, Fl. Am. Sept. 154. 1814. ←

*Rhododendron viscosum* Torr. Fl. U. S. 424. 1824.

*Azalea viscosa hispida* Britton, Mem. Torrey Club 5: 248. 1894.

*Azalea viscosa nitida* Britton, Mem. Torrey Club 5: 248. 1894.

A shrub 0.5–3 dm. long, with loosely pubescent twigs, sometimes diffusely branched; leaf-blades cuneate or obovate, or individually oblong or elliptic-oblongate, 2–6 cm. long, thickish, usually abruptly gland-tipped, ciliate, pubescent on the midrib beneath, dull, shining or glaucous, especially beneath, short-petioled; flower-clusters expanding after the leaves; pedicels glandular-pubescent; calyx-lobes ovate to oblong-ovate, pectinate-ciliate, obtuse; corolla white or pink, 2.5–3.5 cm. long, the tube rather abruptly dilated near the limb, the lobes acute or abruptly acuminate; anthers about 2 mm. long; capsules oblong-ovoid, 1.5–2 cm. long, glandular-hirsute.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Maine to Ohio, Florida, and Mississippi.

ILLUSTRATIONS: Meerb. Pl. Sel. pl. 9; Torr. Fl. N. Y. pl. 66; Bot. Reg. 5: pl. 414; Britt. & Brown, Ill. Fl. f. 2747; ed. 2. f. 3219.

8. *Azalea oblongifolia* Small, Fl. SE. U. S. 883. 1903.

A shrub 2 m. tall or less, with erect or spreading branches and finely pubescent and somewhat hirsute twigs; leaf-blades oblong-oblongate or obovate, or individually oblong, 4–10 cm. long, abruptly gland-tipped, ciliate, dull-green, slightly paler beneath than above, strigillose on both sides, short-petioled; flower-clusters expanding after the leaves; pedicels finely pubescent and somewhat hirsute; calyx-lobes lanceolate, sparingly ciliate, acute or acutish; corolla white or pink, 3.5–4 cm. long, the tube finely glandular-pubescent, dilated near the limb, the lobes rather narrow, acute; anthers about 3 mm. long; capsules not seen.

TYPE LOCALITY: Tom Green County, Texas.

DISTRIBUTION: Arkansas and Texas.

9. *Azalea serrulata* Small, Fl. SE. U. S. 883. 1903.

A shrub 4 m. tall or less, with irregularly spreading branches and sparingly strigose twigs; leaf-blades oblong or oval, or individually elliptic-oblongate, 4–9 cm. long, abruptly gland-tipped, serrulate-ciliate, shining, finely reticulate, glabrous, except for scattered hairs on the midrib and on the short petiole; flower-clusters expanding after the leaves; pedicels glandular-hirsute; calyx-lobes ovate, long-ciliate, obtuse; corolla white, 3–3.5 cm. long, the tube somewhat enlarged near the base, expanded near the limb, glandular-pubescent, the lobes narrow, acute or acuminate; anthers about 2.5 mm. long; capsules not seen.

TYPE LOCALITY: Lake County, Florida.

DISTRIBUTION: Peninsular Florida.

10. *Azalea arborescens* Pursh, Fl. Am. Sept. 152. 1814.

*Azalea fragrans* Raf. Ann. Nat. 12. 1820.

*Rhododendron arborescens* Torr. Fl. U. S. 425. 1824.

A shrub mostly less than 3 m. tall, with erect or ascending stems and branches, or sometimes a tree rarely 6 m. tall, the twigs glabrous or with few strigose hairs; leaf-blades elliptic,

oval, oblanceolate, or cuneate, 4–10 cm. long, abruptly gland-tipped, ciliate, but otherwise glabrous at maturity, shining above, bright-green and glaucous beneath, short-petioled; flower-clusters expanding after the leaves; pedicels glandular-pubescent; calyx-lobes oblong to lanceolate, glandular-ciliate, obtuse or acutish; corolla white or pink, 3–4 cm. long, the lobes mostly acuminate; anthers about 2 mm. long; capsules oblong to narrowly ovoid, 1–2 cm. long, copiously glandular-pubescent.

TYPE LOCALITY: Near the Blue Mountains, Pennsylvania.

DISTRIBUTION: Pennsylvania to Georgia, Kentucky, and Alabama.

ILLUSTRATIONS: Garden & Forest 1: f. 64; Britt. & Brown, Ill. Fl. f. 2746; ed. 2. f. 3218.

### 11. *Azalea prunifolia* Small, Fl. SE. U. S. ed. 2. 1356. 1913.

A shrub 3 m. tall or less, with irregular branches and glabrous twigs; leaf-blades obovate, oval, or narrowly elliptic, 2.5–8 cm. long, abruptly gland-tipped, acute or slightly acuminate, deep-green above, somewhat pale-green beneath, glabrous, except for scattered hairs on the midrib and on the veins beneath, and the ciliate margins, slender-petioled; flower-clusters expanding after the leaves; pedicels hirsute; calyx-lobes ovate or half-orbicular, coarsely long-ciliate, obtuse; corolla crimson, 2–2.5 cm. long, the tube glabrous or with scattered hairs, gradually dilated from the base to the limb, the lobes broad, abruptly pointed; anthers 2.5–3 mm. long; capsules gradually narrowed upward, about 2 cm. long, strigose.

TYPE LOCALITY: About two miles northwest of Cuthbert, Georgia.

DISTRIBUTION: Southwestern Georgia and eastern Alabama.

### 12. *Azalea californica* T. & G.; Durand, Jour. Acad.

Phila. II. 3: 94. 1855.

*Azalea occidentalis* T. & G.; Torr. Pacif. R. R. Rep. 4: 116. 1857.

*Rhododendron occidentale* A. Gray, Bot. Calif. 1: 458. 1876.

A shrub 3 m. tall or less, with glabrous or sparingly soft-pubescent twigs; leaf-blades elliptic to oblong-oblanceolate, 3–9 cm. long, acute or obtuse and abruptly gland-tipped, with short scattered hairs on both sides, or merely ciliate at maturity, except the pubescent petiole; flower-clusters appearing after the leaves; pedicels glandular-pubescent; calyx-lobes oblong to ovate, ciliate, obtuse; corolla white or pink-tinged and with a yellow band on each lobe, 3.5–4.5 cm. long, the lobes acute or acutish; anthers 2.5–3 mm. long; capsules oblong or somewhat narrowed upward, 1–2 cm. long, pubescent.

TYPE LOCALITY: Hills along Deer Creek, Nevada County, California.

DISTRIBUTION: Mountains of southern Oregon and California.

ILLUSTRATION: M. E. Parsons, Wild Fl. Calif. 87.

## 8. RHODORA L. Sp. Pl. ed. 2. 561. 1762.

Shrubs with many stiff branches and branchlets. Leaves alternate, approximate or scattered on the young branchlets; blades rather broad, thinnish, entire, sometimes undulate, somewhat callous-margined, petioled. Flowers in clusters appearing before the leaves, from buds of few thin caducous scales. Calyx very small, shallowly lobed, usually oblique. Corolla bright-colored, irregular, 2-lipped, the tube very short, the upper lip with 3 narrow lobes, the lower lip parted nearly or quite to the base, the lobes nearly distinct. Stamens 10, not exceeding the corolla; filaments slender, somewhat unequal; anthers globular or nearly so. Ovary 5-celled, very short; style slender, declined; stigma enlarged, slightly lobed. Capsule stout, curved, obscurely lobed.

Type species, *Rhodora canadensis* L.

### 1. *Rhodora canadensis* L. Sp. Pl. ed. 2. 561. 1762.

*Rhodora congesta* Moench, Meth. 68. 1794.

*Rhododendron pulchellum* Salisb. Prodr. 287. 1796.

*Rhododendron Rhodora* G. Don, Gen. Hist. 3: 848. 1834.

*Rhododendron canadense* B. S. P. Prel. Cat. N. Y. 33. 1888.

A much-branched shrub 1 m. tall or less, with irregular erect or ascending slender branches and finely pubescent twigs; leaf-blades oblong, elliptic, or oval, 2–6 cm. long, obtuse at the apex and usually mucronulate, deep-green and somewhat strigose above, pale and more or



less tomentulose beneath, short-petioled; pedicels glaucous, sometimes finely pubescent; calyx-lobes blunt, finely glandular; corolla rose-purple or white, 1.5–2 cm. long, the lobes of both lips narrow, obtuse; stamens 10; style often somewhat exserted; capsules oblong or slightly narrowed upward, 9–16 mm. long, glaucous, glandular-pubescent.

TYPE LOCALITY: Canada.

DISTRIBUTION: Newfoundland and Nova Scotia to Quebec, New Jersey, and Pennsylvania.

ILLUSTRATIONS: L'Her. Stirp. Nov. *pl.* 68; Bot. Mag. *pl.* 474; Nouv. Duham. 3: *pl.* 53; Lam. Tab. Encyc. *pl.* 364; Britt. & Brown, Ill. Fl. f. 2748; ed. 2. f. 3220.

## 9. THERORHODION (Maxim.) Small, gen. nov.

*Rhododendron* §*Therorhodon* Maxim. Mém. Acad. St.-Petersb. VII. 16: 47. 1870.

Shrubs with depressed stems, the bud-scales thin, persistent. Leaves alternate, often approximate at the ends of branches; blades broad, thinnish, but somewhat chartaceous, usually obscurely toothed, veiny, sessile or nearly so. Flowers perfect, solitary or two together, terminating leafy shoots. Calyx rotate; lobes 5, foliaceous, persistent. Corolla bright-colored, rotate, deeply lobed, divided to the base on the lower side; lobes 5, broad, spreading, somewhat unequal. Stamens 10, declined, shorter than the corolla; filaments unequal; anthers oval or obovoid. Ovary mostly 5-celled, slightly lobed, depressed; style elongate, curved, slightly enlarged at the apex; stigma shallowly lobed. Capsule thin-walled.

Type species, *Rhododendron camtschaticum* Pall.

Corolla pubescent without, the lobes obovate to broadly oblong, about two-thirds as long as the tube; leaf-blades neither glandular-ciliate nor glandular-pubescent beneath.

Corolla glabrous, the lobes narrowly oblong, very much longer than the short tube; leaf-blades glandular-ciliate and glandular-pubescent beneath.

1. *T. camtschaticum*.

2. *T. glandulosum*.

### 1. *Therorhodon camtschaticum* (Pall.) Small.

*Rhododendron camtschaticum* Pall. Fl. Ross. 1: 48. 1784.

*Rhodothamnus camtschaticus* Lindl.; Paxt. Fl. Gard. 1: *pl.* 22. 1853.

A low or depressed shrub, mostly less than 2 dm. tall, usually much branched; leaf-blades cuneate to obovate, or oval on the upper part of the plant, 1–4 cm. long, obtuse or rounded at the apex, except the glandular tip, obscurely crenate, bristly ciliate, veiny at maturity, shining, sessile or nearly so; calyx-lobes oblong to cuneate, mostly 9–21 mm. long in anthesis, glandular-pubescent and bristly-ciliate; corolla rose-purple, 2–2.5 cm. long, pubescent, the lobes erose and often ciliolate; capsules ovoid, 8–10 mm. long.

TYPE LOCALITY: Shores of the Sea of Okhotsk, Kamtchatka.

DISTRIBUTION: Alaska, through the Aleutian Islands to Japan.

ILLUSTRATIONS: Pall. Fl. Ross. *pl.* 33; Paxt. Fl. Gard. 1: *pl.* 22.

### 2. *Therorhodon glandulosum* Standley, sp. nov.

A low shrub forming dense clumps about 1 dm. tall, usually copiously branched; leaf-blades spatulate, often broadly so, or oval or ovate, on the upper part of the branches, 1–2 cm. long or less, obtuse, often rounded and abruptly pointed, or sometimes acute at the apex, crenulate, glandular-ciliate, veiny, somewhat shining, sessile or nearly so; calyx-lobes oblong, often narrowly so, to elliptic-oblong, 8–10 mm. long in anthesis, glandular-pubescent and glandular-ciliate; corolla rose-purple, 2 cm. long or slightly shorter, glabrous, the lobes somewhat erose, eciliolate; capsules oval, 7–9 mm. long, pubescent with short white hairs.

Type collected at the foot of Kigluaik Mountains, near Oogluk Bay, Imuruk Basin, in the vicinity of Port Clarence, Alaska, August 4, 1901, *F. A. Walpole 1725* (U. S. Nat. Herb.).

DISTRIBUTION: Imuruk Basin, Alaska.

## 10. AZALEASTRUM Rydb. Mem. N. Y. Bot. Gard. 1: 297. 1900.

Shrubs with much-branched stems, the branches erect or ascending. Leaves alternate, deciduous, clustered or approximate on young shoots; blades membranous, rather broad, undulate or repand. Flowers solitary or few together in axillary or lateral clusters, the thinnish bud-scales caducous. Calyx rotate; lobes 5, foliaceous, membranous, persistent. Corolla white or pale, rotate-campanulate or nearly rotate, not 2-lipped; lobes 5, broad, slightly un-

equal, entire. Stamens 5–10, not declined; filaments very slender; anthers obovoid or globular. Ovary 5-celled, depressed; style rather slender, slightly curved, dilated at the apex; stigma 4-lobed. Capsule short and stout, surrounded by the calyx.

Type species, *Rhododendron albiflorum* Hook.

1. **Azaleastrum albiflorum** (Hook.) Rydb. Mem. N. Y. Bot.  
Gard. 1: 297. 1900.

*Rhododendron albiflorum* Hook. Fl. Bor. Am. 2: 43. 1834.

*Azalea albiflora* Kuntze, Rev. Gen. 387. 1891.

?*Cladothamnus campanulatus* Greene, Erythea 3: 65. 1895.

Shrub 2 m. tall or less, with usually pale, coarsely and finely pubescent branchlets; leaf-blades oblong, elliptic, or oval, or somewhat broadened upward, 2–7 cm. long, acute or abruptly gland-tipped, bright-green and often somewhat shining above, paler and often slightly pubescent beneath, undulate or repand-crenate, the short petioles pubescent; pedicels copiously pubescent; calyx-lobes oblong varying to ovate or obovate, mostly 9–12 mm. long, finely pubescent; corolla usually white, 2 cm. long or less, the lobes very broad, about as long as the tube; filaments very pubescent at least from the middle to the base; capsules ovoid, 7–10 mm. long, pubescent.

TYPE LOCALITY: Alpine woods of the Rocky Mountains.

DISTRIBUTION: Northern Rocky Mountains, as far south as Montana, to British Columbia and Oregon.

ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl.* 133; Bot. Mag. *pl.* 3670; Henshaw, Mountain Fl. Am. *pl.* 97; Brown & Schäffer, Alp. Pl. Can. *pl.* 60.

DOUBTFUL SPECIES

AZALEASTRUM WARRENI A. Nelson, Bot. Gaz. 54: 67 (1913), described from specimens collected on Mt. Zirkel, Jackson County, Colorado, may be distinct from *Azaleastrum albiflorum*. We have not seen specimens, and Professor Nelson does not compare the two species in his description.

11. **RHODODENDRON** L. Sp. Pl. 392. 1753.

Shrubs or small trees, with glabrous, pubescent, or glandular-waxy foliage and deciduous bud-scales. Leaves alternate, scattered or sometimes approximate at the ends of the branches; blades broad, thick, often leathery, entire, petioled. Flowers in usually dense clusters which appear before or after the leafy shoots of the season. Calyx usually saucer-shaped, small; lobes 5, short and inconspicuous, persistent. Corolla white or colored, campanulate, or rotate-campanulate, deeply lobed; lobes 5, unequal, broad, flat or crisped. Stamens mostly 10 or rarely 5, shorter than the corolla or not much longer; filaments slender, declined; anthers short, mostly oval or obovoid. Ovary 5-celled, shallowly lobed, depressed or slightly elongate; style curved, elongate, enlarged at the apex; stigma sometimes obscurely lobed. Capsule narrowly ovoid to oblong, thick-walled.

Type species, *Rhododendron ferrugineum* L.

Leaf-blades not glandular-dotted or scaly.

Pedicels glandular or pubescent, at least in anthesis; plants of the Atlantic States.

Calyx-lobes longer than wide; corolla mainly white or pink; pedicels viscid.

Calyx-lobes wider than long; corolla rose-purple or lilac-purple; pedicels not viscid.

Pedicels glabrous; plants of the Pacific States.

Corolla rose-purple, 3 cm. long or more.

Corolla white, less than 3 cm. long.

Leaf-blades glandular-dotted or scaly.

Erect shrubs; corolla funnelform or campanulate-funnelform.

Flower-clusters appearing after the leafy shoots of the season; leaf-blades acute or acuminate.

Corolla 1.5–2 cm. long; calyx-lobes of a deltoid type.

Corolla 2.5–3 cm. long; calyx-lobes of an ovate type.

Flower-clusters appearing before the leafy shoots of the season; leaf-blades obtuse or retuse.

Depressed shrubs; corolla rotate-campanulate.

1. *R. maximum*.

2. *R. catawbiense*.

3. *R. californicum*.

4. *R. macrophyllum*.

5. *R. carolinianum*.

6. *R. minus*.

7. *R. Chapmanii*.

8. *R. lapponicum*.



1. *Rhododendron maximum* L. Sp. Pl. 392. 1753.*Rhododendron purpureum* G. Don, Gen. Hist. 3: 843. 1834.*Rhododendron Purshii* G. Don, Gen. Hist. 3: 843. 1834.

An evergreen shrub commonly 5 m. tall, or rarely a small tree, with scurfy-pubescent twigs; leaf-blades oblong or oblong-ob lanceolate, 10–25 cm. long, acute or short-acuminate, glabrous, or somewhat scurfy beneath, bright-green above, pale-green beneath, abruptly narrowed at the base, the stout petioles tomentulose when young; calyx-lobes ovate to oblong, mostly longer than wide; corolla mainly white or pink, often somewhat greenish in the throat and with yellow or orange spots within, broadly campanulate, 2–3 cm. long, the lobes not crisped; filaments slender, the longer ones about 2 cm. long; anthers about 2 mm. long; style elongate; capsules narrowly oblong or cylindric-oblong or slightly narrowed upward, 1–1.5 cm. long; seeds less than 2 mm. long.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Nova Scotia to Ontario, Ohio, Georgia, and Alabama.

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 364; Bot. Mag. pl. 951; Michx. f. Hist. Arb. Am. 3<sup>3</sup>: pl. 4; Schkuhr, Handb. pl. 117; Bigel. Med. Bot. pl. 51; Sarg., Silva pl. 238; Britt. & Brown, Ill. Fl. f. 2750; ed. 2. f. 3222; Sarg. Man. f. 582; Britton, N. Am. Trees f. 687.2. *Rhododendron catawbiense* Michx. Fl. Bor. Am. 1: 258. 1803.

An evergreen shrub commonly 1–3 m. tall, or rarely a small tree, with finely pubescent twigs; leaf-blades oblong, elliptic, or oval, 7–16 cm. long, abruptly pointed at the apex, glabrous, dark-green above, pale-green beneath, mostly rounded or subcordate at the base, the stout petioles pubescent; calyx-lobes half-orbicular or broadly deltoid, much wider than long; corolla rose-purple or lilac-purple, broadly campanulate, 3.5–5 cm. long, the lobes scarcely undulate; filaments slender, the longer ones about 3 cm. long; anthers about 3 mm. long; style elongate; capsules narrowly oblong, or slightly enlarged at the base, 2–2.5 cm. long; seeds less than 3 mm. long.

TYPE LOCALITY: High mountains of North Carolina.

DISTRIBUTION: Mountains of Virginia and West Virginia to Georgia and Alabama; rarely eastward to near the coastal plain.

ILLUSTRATIONS: Bot. Mag. pl. 1671; Bot. Cab. pl. 1176; Britt. &amp; Brown, Ill. Fl. f. 2751; ed. 2. f. 3223; Britton, N. Am. Trees f. 688; Lounsberry, S. Wild Fl. pl. 120.

3. *Rhododendron californicum* Hook. Bot. Mag. pl. 4863. 1855.

A shrub 3 m. tall or less, or sometimes a small tree, with glabrous twigs; leaf-blades oblong, elliptic, or somewhat spatulate, 6–15 cm. long, obtuse and mucronate at the apex, glabrous, paler beneath than above, acute to rounded at the base, the stout petioles glabrous; calyx-lobes very broad and very short, much wider than long; corolla rose-purple, broadly campanulate, 3–4 cm. long, the lobes undulate; filaments stout, the longer ones about 2 cm. long; anthers 2.5–3 mm. long; style short; capsules ovoid, 1.5–2 cm. long; seeds fully 3 mm. long.

TYPE LOCALITY: Mountains of California.

DISTRIBUTION: British Columbia to California.

ILLUSTRATION: Bot. Mag. pl. 4863; Britton, N. Am. Trees f. 689; M. E. Parsons, Wild Fl. Calif. 235.

4. *Rhododendron macrophyllum* G. Don, Gen. Hist. 3: 843. 1834.

An erect shrub 5 m. tall or less, with glabrous twigs; leaf-blades oblong or slightly broadened upward, 12–20 cm. long, abruptly pointed at the apex, glabrous, paler beneath than above, somewhat acuminate at the base, the very stout petioles glabrous; calyx-lobes very broad and short, much wider than long; corolla white, campanulate, less than 3.5 cm. long, the lobes oblong; capsules oblong, about 1.5 cm. long; seeds about 3.5 mm. long.

TYPE LOCALITY: Northwestern coast of America.

DISTRIBUTION: Washington.

5. *Rhododendron carolinianum* Rehder, Rhodora 14: 99. 1912.

A much-branched shrub, with resinous-dotted foliage; leaf-blades elliptic, oblong-elliptic, or somewhat broadened upward, 8–13 cm. long, acute or acuminate at both ends, somewhat

shining above, paler beneath and copiously resinous-dotted; petioles stout but relatively long, resinous-dotted and slightly pubescent above; calyx-lobes ovate, often broadly so; corolla rose-colored, often mottled, 1.5–2 cm. long, broadly funnelform, the tube short; longer filaments less than 2.5 cm. long; capsules oblong-ovoid, 8–12 mm. long.

TYPE LOCALITY: North Carolina.

DISTRIBUTION: Mountains of North Carolina, Tennessee, and South Carolina.

ILLUSTRATIONS: Bot. Reg. *pl.* 37.

## 6. *Rhododendron minus* Michx. Jour. Hist. Nat. 1: 412. 1792.

*Rhododendron punctatum* Andr. Bot. Repos. *pl.* 36. 1798.

*Rhododendron Cuthbertii* Small, Torrey 2: 9. 1902.

A branching straggling shrub, with resinous-dotted foliage; leaf-blades elliptic or oval, 3–12 cm. long, acute or somewhat acuminate at both ends, deep-green above, paler and copiously resinous-dotted beneath; petioles stout, but relatively long, resinous and more or less pubescent at least when young; calyx-lobes deltoid, often broadly so or rarely deltoid-ovate; corolla clear rose-colored, 2.5–3 cm. long, funnelform-campanulate, the tube rather long; longer filaments more than 2.5 cm. long; anthers about 2.5 mm. long; capsules oblong or oblong-ovoid, 8–12 mm. long.

TYPE LOCALITY: Banks of the Savannah river near Augusta, Georgia.

DISTRIBUTION: Piedmont region and adjacent coastal plain, South Carolina, Georgia, and Alabama.

ILLUSTRATIONS: Andr. Bot. Repos. *pl.* 36; Vent. Descr. Pl. Cels *pl.* 15; Bot. Mag. *pl.* 2285.

## 7. *Rhododendron Chapmanii* A. Gray, Proc. Am. Acad. 12: 61. 1876.

An evergreen shrub 2 m. tall or less, with glandular-dotted foliage and erect rigid branches; leaf-blades oblong or oval, 2–5 cm. long, obtuse or retuse at the apex, somewhat lustrous above, glandular-dotted beneath, revolute, abruptly narrowed at the base; petioles short, resinous-dotted, glabrous; calyx-lobes broadly deltoid or rounded, broader than long; corolla rose-colored, 2.5–3 cm. long, funnelform-campanulate, the tube rather short and stout; longer filaments more than 2.5 cm. long; anthers less than 2.5 mm. long; capsules nearly 1 cm. long.

TYPE LOCALITY: Western Florida.

DISTRIBUTION: Western Florida.

## 8. *Rhododendron lapponicum* (L.) Wahl. Fl. Suec. 249. 1824.

*Azalea lapponica* L. Sp. Pl. 151. 1753.

A depressed much-branched shrub mostly less than 2 dm. tall; leaf-blades oblong, elliptic, or oval, varying to broadest above or below the middle, 1.5 cm. long or less, obtuse, copiously resinous-dotted, slightly paler beneath than above, short-petioled; clusters 3–6-flowered; calyx-lobes ovate to oblong-ovate; corolla purple and somewhat mottled, rotate-campanulate, about 1 cm. long; stamens 5–8 or rarely 10, the anthers much-exserted; capsules ovoid or oblong-ovoid, 4–5 mm. long.

TYPE LOCALITY: Lapland.

DISTRIBUTION: Greenland, Arctic America to Labrador, the alpine regions of New England, New York, and Unalaschka; also in northern Europe and Asia.

ILLUSTRATIONS: L. Fl. Lapp. *pl.* 6; Fl. Dan. *pl.* 966; Bot. Mag. *pl.* 3106; E. & P. Nat. Pfl. 41: f. 24<sup>d</sup>; Britt. & Brown, Ill. Fl. f. 2749; ed. 2. f. 3221.

## 12. *BILTIA* Small, Fl. SE. U. S. 884. 1903.

Shrubs with tall irregularly branched stems. Leaves alternate, deciduous; blades rather broad, thinnish, glabrous or essentially so when mature except the ciliate margins, nearly entire, petioled. Flowers in clusters from few-scaled buds, preceding the leaves and leafy shoots. Calyx a mere membranous undulate border. Corolla bright-colored, rotate-campanulate, irregular, oblique; lobes 5, unequal, broad, the two lower larger than the others, the middle one of the three upper-exterior. Stamens 7 or fewer, declined; filaments slender; anthers short, oval or globular. Ovary 5-celled, slightly lobed; style elongate, declined, enlarged at the apex; stigma obscurely lobed. Capsule narrow, slightly contracted near the apex, 5-ridged.

Type species, *Rhododendron Vaseyi* A. Gray.



1. *Biltia Vaseyi* (A. Gray) Small, Fl. SE. U. S. 884. 1903.*Rhododendron Vaseyi* A. Gray, Proc. Am. Acad. 15: 48, 1879.*Azalea Vaseyi* Rehder, Möll. Deuts. Gärtn.-Zeit. 14: 332. 1899.

An asymmetric shrub 5 m. tall or less, with slender branches and usually sparingly pubescent twigs; leaf-blades elliptic or oblong-elliptic, 6–15 cm. long, thick-membranous, acuminate at both ends, ciliate, with a prominent midrib beneath, undulate or very shallowly toothed; pedicels somewhat glandular; calyx flat, the edge glandular-erose; corolla pale rose-colored, 2.5–3 cm. long, the upper lobes with yellow-orange or reddish-orange spots, all rounded; stamens 7 or sometimes 5; style long-exserted; capsules narrowly oblong-ovoid, 1–14 mm. long, glandular-pubescent.

TYPE LOCALITY: Balsam Mountains, seven miles southwest of Webster, Jackson County, North Carolina.

DISTRIBUTION: Mountain slopes and summits, North Carolina.

ILLUSTRATIONS: Garden & Forest 1: f. 60; Gard. Chron. III. 20: f. 14; Meehan's Mo. 7: pl. 7.

13. *MENZIESIA* Smith, Pl. Ic. Ined. pl. 56. 1791.

Shrubs with erect or spreading branches and variously pubescent foliage. Leaves alternate, approximate on the twigs, deciduous; blades broad, thin, often strigose, ciliate, entire or obscurely toothed, gland-tipped, short-petioled. Flowers appearing with the leaves, in clusters terminating the branches, nodding, the pedicels becoming erect in fruit. Calyx small, flat or saucer-shaped, persistent, circular or shallowly lobed; lobes 4, bristly ciliate. Corolla white, pink, purplish, or greenish, globular-ovoid, globular-urceolate, campanulate, or cylindraceous; tube stout, often swollen; limb very small, the lobes rounded, much shorter than the tube, often erect. Stamens 8, included; filaments subulate, sometimes pubescent at the base; anthers narrow, linear to linear-sagittate. Ovary 4-celled, obscurely lobed, glabrous or sparingly pubescent, commonly ovoid; style columnar or subulate, included; stigma truncate. Capsule slightly elongate, ovoid, oval, or obovoid, firm, rather thick-walled, 4-valved. Seeds numerous, abruptly pointed or tailed.

Type species, *Menziesia ferruginea* Smith.

Seeds short (1–1.5 mm.), abruptly pointed; species of the Alleghenies.

Seeds long, (2–2.5 mm.), tailed; species of northwestern North America.

Filaments glabrous; calyx ciliate with short gland-tipped hairs; corolla of an ovoid type.

Filaments pubescent; calyx ciliate with long, often glandless hairs; corolla of a cylindraceous type.

1. *M. pilosa*.2. *M. glabella*.3. *M. ferruginea*.1. *Menziesia pilosa* (Michx.) Pers. Syn. Pl. 1: 420. 1805.*Azalea pilosa* Michx. Jour. Hist. Nat. 1: 410. 1792.*Menziesia Smithii* Michx. Fl. Bor. Am. 1: 235. 1803.*Menziesia globularis* Salisb. Parad. Lond. pl. 44. 1806.*Menziesia ferruginea* β Sims, Bot. Mag. pl. 1571. 1813.

An erect or somewhat spreading shrub 2 m. tall or less, with loosely pubescent twigs; leaf-blades elliptic to oval or elliptic-oblongate, 1.5–5 cm. long, acute or abruptly gland-tipped, strigose, especially above, glaucous or glaucescent beneath, ciliate, short-petioled; pedicels glandular-pubescent; calyx circular or slightly angled, glandular-ciliate; corolla white to pink, ovoid or globular-ovoid to campanulate-ovoid, 7–8 mm. long, the lobes mostly half-orbicular; stamens 5–6 mm. long, the filaments glabrous; capsules ovoid, 5–6 mm. long, with rather rigid gland-tipped hairs; seeds 1–1.5 mm. long.

TYPE LOCALITY: About the source of the Catawba River, North Carolina.

DISTRIBUTION: Mountains, Pennsylvania to Georgia.

ILLUSTRATIONS: Salisb. Parad. Lond. pl. 44; Bot. Mag. pl. 1571; Britt. & Brown, Ill. Fl. f. 2752; ed. 2. f. 3224.

2. *Menziesia glabella* A. Gray, Syn. Fl. N. Am. 2<sup>1</sup>: 39. 1878.*Menziesia globularis* Hook. Fl. Bor. Am. 2: 41. 1834. Not *M. globularis* Salisb. 1806.

An erect shrub with puberulent twigs; leaf-blades obovate to oblong-obovate or oval-obovate, 2–5 cm. long, mostly obtuse or rounded at the apex and minutely gland-tipped, serrulate-crenate and minutely glandular-ciliate, glabrous or nearly so and glaucous beneath, bright-green and sparingly strigose above, short-petioled, the petioles puberulent; pedicels

Key worthless & descriptions  
more or less inadequate. Connel.  
1933.  
Filaments glabrous in all 3 species.  
Calyx character variable.

Maryland (Em. Arb.)



puberulent and often somewhat glandular; calyx prominently lobed, rather short-ciliate; corolla ovoid-campanulate or urceolate, 7–9 mm. long, the lobes half-orbicular or ovate-orbicular; stamens 6–8 mm. long; capsules oval or obovoid-oval, 5–8 mm. long, minutely pubescent; seeds about 2–2.5 mm. long.

TYPE LOCALITY: Rocky Mountains, lat. 49°–56°.

DISTRIBUTION: Alberta and British Columbia to Wyoming and Idaho, and said to occur eastward to Lake Superior.

ILLUSTRATIONS: Henshaw, Mountain Fl. Am. *pl.* 98; Britt. & Brown, Ill. Fl. *f.* 2753; ed. 2. *f.* 3225.

### 3. *Menziesia ferruginea* Smith, Pl. Ic. Ined. *pl.* 56. 1791.

*Menziesia urceolaris* Salisb. Parad. Lond. under *pl.* 44. 1806.

A straggling or erect shrub 2.5 m. tall or less, with sparingly fine-pubescent twigs; leaf-blades oblong or elliptic to obovate, 3–6 cm. long, acute or obtuse and gland-tipped, glandular-ciliate, deep-green above, pale-green beneath, strigose on both sides, but usually more copiously so above, short-petioled, the petioles with long hairs; pedicels glandular-hirsute; calyx circular or obscurely lobed, long-ciliate; corolla oblong-ovoid, becoming cylindraceous, 9–13 mm. long, the lobes half-orbicular; stamens 7–8 mm. long, capsules ovoid, 6–8 mm. long, glabrous; seeds 2–2.5 mm. long.

TYPE LOCALITY: Western North America.

DISTRIBUTION: Alaska to British Columbia and Oregon.

ILLUSTRATIONS: Smith, Pl. Ic. Ined. *pl.* 56; Lam. Tab. Encyc. *pl.* 285; Brown & Schäffer, Alp. Pl. Can. *pl.* 61.

### 14. *PHYLLODOCE* Salisb. Parad. Lond. *pl.* 36. 1806.

Low or depressed heath-like shrubs, with tufted or matted branches. Leaves alternate, crowded, persistent; blades narrow, usually linear, thick, revolute and usually serrulate-edged. Flowers in umbel-like or raceme-like clusters at the ends of the branchlets, usually spreading or nodding on erect pedicels. Calyx persistent; lobes 4–6, narrow, slightly united, often glandular. Corolla ovoid, urceolate, campanulate, or nearly rotate, white, yellow, or purple; lobes 4–6, very short or as long as the tube, imbricate. Stamens 8–12, included or exerted; filaments short or elongate, sometimes pubescent, scarcely if at all dilated; anthers oblong, sometimes narrowly so, opening at the top, unappendaged. Ovary 4–6-lobed, globular or depressed; style slender; stigma minute, but sometimes swollen. Capsule erect, oval, globose or spheroidal, 4–6-valved from the top.

Type species, *Phyllodoce taxifolia* Salisb.

Corolla of an ovoid type, constricted at the throat, slightly lobed; calyx not glandular.

Corolla purple to deep-pink.

Corolla white to sulphur-yellow.

Filaments glabrous; calyx-lobes linear to linear-lanceolate.

Filaments pubescent; calyx-lobes lanceolate to oblong-lanceolate.

Corolla campanulate or nearly rotate, deeply lobed; calyx glandular.

Corolla-lobes much shorter than the tube; filaments slightly longer than the anthers.

Corolla-lobes about as long as the tube; filaments much longer than the anthers.

1. *P. caerulea*.

2. *P. aleutica*.

3. *P. glanduliflora*.

4. *P. empetrifomis*.

5. *P. Breweri*.

#### 1. *Phyllodoce caerulea* (L.) Bab. Man. 194. 1843.

*Andromeda caerulea* L. Sp. Pl. 393. 1753.

*Andromeda taxifolia* Pall. Fl. Ross. 2: 54. 1788.

*Phyllodoce taxifolia* Salisb. Parad. Lond. *pl.* 36. 1806.

*Menziesia caerulea* Sw. Trans. Linn. Soc. 10: 377. 1811.

*Bryanthus taxifolius* A. Gray, Proc. Am. Acad. 7: 368. 1868.

Plants 15 cm. tall or less, usually in depressed mats; leaf-blades linear, 4–9 mm. long, obtuse, serrulate; pedicels 2–6 together, or solitary, glandular; calyx 8–10 mm. wide, the lobes linear to lanceolate; corolla ovoid to urceolate, 7–8 mm. long, glabrous; stamens included; filaments much longer than the anthers, glabrous or nearly so; capsules globular or oval, 3.5–4.5 mm. in diameter.

TYPE LOCALITY: Lapland.

DISTRIBUTION: Greenland, Labrador, and Quebec, and on mountain-tops in Maine and New Hampshire; circumboreal.

ILLUSTRATIONS: L. Fl. Lapp. *pl.* 1; Fl. Dan. *pl.* 57; Pall. Fl. Ross. *pl.* 72, *f.* 2; Salisb. Parad. Lond. *pl.* 36; Bot. Cab. *pl.* 164; Trans. Linn. Soc. 10: *pl.* 30; Sv. Bot. *pl.* 535; Britt. & Brown, Ill. Fl. *f.* 2760; ed. 2. *f.* 3233.



2. *Phyllodoce aleutica* (Spreng.) A. Heller, *Muhlenbergia* 1: 1. 1900.

*Menziesia aleutica* Spreng. Syst. 2: 202. 1825.

*Phyllodoce Pallasiana* D. Don, Edinb. New Phil. Jour. 17: 159. 1834.

*Bryanthus aleuticus* A. Gray, Proc. Am. Acad. 7: 368. 1868.

Plants 20 cm. tall or less, more or less matted; leaf-blades linear or nearly so, 5–11 mm. long, obtuse, serrulate; pedicels 6–14 together, glandular; calyx 9–10 mm. wide, the lobes linear to linear-lanceolate; corolla white or whitish, globose-urceolate, 6–8 mm. long, glabrous; stamens included; filaments much longer than the anthers, glabrous.

TYPE LOCALITY: Aleutian Islands.

DISTRIBUTION: Alaska and Unalashka; also from Kamtchatka to Japan.

ILLUSTRATION: Mém. Acad. St.-Pétersb. VI. 2: pl. 3.

3. *Phyllodoce glanduliflora* (Hook.) Coville, *Mazama* 1: 196. 1897.

*Menziesia glanduliflora* Hook. Fl. Bor. Am. 2: 40. 1834.

*Bryanthus glanduliflorus* A. Gray, Proc. Am. Acad. 7: 368. 1868.

Plants 30 cm. tall or less, tufted or matted; leaf-blades linear or narrowly oblong, 4–14 mm. long, obtuse, serrulate; pedicels 3–8 together, puberulent and glandular-pubescent; calyx 8–10 mm. wide, the lobes lanceolate to oblong-lanceolate; corolla sulphur-yellow, ovoid, 5–8 mm. long, pubescent; stamens included; filaments much longer than the anthers, pubescent; capsules globular, about 3 mm. in diameter.

TYPE LOCALITY: Mountains north of Smoking River, Rocky Mountains, in lat. 56°.

DISTRIBUTION: Alaska and Yukon to Montana and Oregon.

ILLUSTRATIONS: Henshaw, Mountain Fl. Am. pl. 26; Brown & Schäffer, Alp. Pl. Can. pl. 59, b.

PHYLLODOCE HYBRIDA Rydb. Mem. N. Y. Bot. Gard. 1: 298 (1900) appears to be a hybrid between *P. glanduliflora* and *P. empetriflora*. It is most closely related to *P. glanduliflora*, differing chiefly in the corolla which is not contracted at the throat.

4. *Phyllodoce empetriflora* (J. E. Smith) D. Don, Edinb. New Phil. Jour. 17: 160. 1834.

*Menziesia empetriflora* J. E. Smith, Trans. Linn. Soc. 10: 380. 1811.

*Menziesia Grahmi* Hook. Fl. Bor. Am. 2: 40. 1834.

*Bryanthus empetriflora* A. Gray, Proc. Am. Acad. 7: 367. 1868.

Plants 15 cm. tall or less, tufted or matted; leaf-blades linear or linear-oblong, 6–15 mm. long, obtuse or acutish, serrulate, sometimes obscurely so; pedicels several or many together, finely pubescent; calyx 6–8 mm. wide, the lobes ovate or oblong-ovate; corolla campanulate, deep-pink, 7–9 mm. long, the lobes much shorter than the tube; stamens included; filaments slightly longer than the anthers; capsules globular, 2.5–3.5 mm. in diameter.

TYPE LOCALITY: West coast of North America.

DISTRIBUTION: Yukon to Montana and California.

ILLUSTRATIONS: Bot. Mag. pl. 3176; Henshaw, Mountain Fl. Am. pl. 48; Brown & Schäffer, Alp. Pl. Can. pl. 59, a.

PHYLLODOCE INTERMEDIA (Hook.) Rydb. Mem. N. Y. Bot. Gard. 1: 298 (1900) appears to be another hybrid between *P. empetriflora* and *P. glanduliflora*. It is most closely related to *P. empetriflora*, differing chiefly in the longer and paler corolla.

5. *Phyllodoce Breweri* (A. Gray) A. Heller, *Muhlenbergia* 1: 1. 1900.

*Bryanthus Breweri* A. Gray, Proc. Am. Acad. 7: 367. 1868.

Plants 30 cm. tall or less, usually tufted; leaf-blades linear, usually narrowly so, 6–21 mm. long, obtuse, serrulate, often obscurely so; pedicels numerous, finely pubescent; calyx about 10 mm. wide; lobes ovate to oblong; corolla rose-purple, nearly campanulate, about 8 mm. long, the lobes about as long as the tube; stamens exserted; filaments much longer than the anthers, glabrous; capsules spheroidal, 3–3.5 mm. in diameter.

TYPE LOCALITY: High Sierras of California.

DISTRIBUTION: Mountains of California.

PHYLLODOCE AMABILIS Stapf, Bot. Mag. pl. 8405 (1911), described from plants cultivated at Kew, and thought to have come originally from North America, is related to *P. empetriflora* in its campanulate corolla with short lobes; it differs from *P. empetriflora* chiefly in the white corolla.

15. *KALMIA* L. Sp. Pl. 391. 1753.

Shrubs or small trees, with irregularly branched stems and glabrous, finely pubescent, or glandular foliage. Leaves alternate, opposite, or whorled, usually persistent; blades rela-

tively large, leathery, entire, flat or revolute. Flowers in terminal or lateral corymbs or umbel-like clusters, usually numerous, the pedicels subtended by small thick bracts. Calyx persistent; lobes 5, rather narrow, much longer than the tube. Corolla white or pink, rotate, 10-keeled with the keels running to the sinuses and the lobes; tube short, 10-saccate; lobes short and broad, rounded or obtuse. Stamens 10, shorter than the corolla; filaments subulate or filiform, usually pubescent; anthers ovoid or oval, opening by large pores, springing from the corolla-sacs by the elastically straightening filaments when the corolla-limb expands. Ovary 5-celled, usually depressed; style slender, nearly straight; stigma slightly depressed. Capsule spheroidal or subglobose, 5-valved, seated in the shorter calyx.

Type species, *Kalmia latifolia* L.

Corymbs or flower-clusters lateral.

Corolla large, about 1.5 cm. wide; calyx glabrous; leaf-blades of a cuneate or spatulate type.

1. *K. cuneata*.

Corolla small, 5–10 mm. wide; calyx pubescent; leaf-blades of an oblong, oval, or lanceolate type.

Leaf-blades glabrous, at least at maturity; corolla mostly more than 8 mm. wide.

2. *K. angustifolia*.

Leaf-blades permanently canescent-tomentulose; corolla mostly less than 8 mm. wide.

3. *K. carolina*.

Corymbs or flower-clusters terminal.

Inflorescence simple; filaments long-pubescent at the base; capsule subglobose; branchlets 2-edged.

Capsule spheroidal; calyx half as long as the capsule or more.

Corolla less than 1.5 cm. wide; calyx 5–6.5 mm. wide; leaf-blades typically less than twice as long as wide.

4. *K. microphylla*.

Corolla more than 1.5 cm. wide; calyx 8–10 mm. wide; leaf-blades typically more than twice as long as wide.

5. *K. occidentalis*.

Capsule ovoid-spheroidal or globose; calyx less than half as long as the capsule.

6. *K. polifolia*.

Inflorescence compound; filaments short-pubescent, at least to above the middle; capsule spheroidal; branchlets terete.

7. *K. latifolia*.

### 1. *Kalmia cuneata* Michx. Fl. Bor. Am. 1: 257. 1803.

A low branching shrub with minutely pubescent twigs; leaf-blades spatulate to cuneate, or individually obovate or oblong-spatulate, 1.5–5 cm. long, mucronulate, deep-green and somewhat shining above, pale and sparsely pubescent beneath, sessile or nearly so; clusters few-flowered; pedicels slender, 1–1.5 cm. long, glabrous at maturity; calyx 6.5–7.5 mm. wide, the lobes oblong to ovate-oblong, acute or acutish; corolla white or nearly so, or sometimes pinkish, about 1.5 cm. wide; capsules spheroidal, 4–5 mm. wide, glandular-pubescent.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Low country, North Carolina and South Carolina.

ILLUSTRATIONS: Garden & Forest 8: f. 60; Lounsberry, S. Wild Fl. pl. 125.

### 2. *Kalmia angustifolia* L. Sp. Pl. 391. 1753.

? *Kalmia angustifolia ovata* Pursh, Fl. Am. Sept. 296. 1814.

A shrub 1.5 m. tall or less, with glabrous or glabrate twigs; leaf-blades oblong to lanceolate, 2–6 cm. long, obtuse or acutish, bright-green above, paler beneath, glabrous at least in age, short-petioled; clusters many-flowered; pedicels puberulent and usually also somewhat glandular; calyx 5–6 mm. wide, the lobes ovate, usually abruptly pointed, sparingly puberulent and somewhat glandular; corolla purple to crimson, about 1 cm. wide or sometimes less; style glabrous; capsules spheroidal, 3–3.5 mm. wide, sparingly puberulent and somewhat glandular.

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Newfoundland, Labrador, and the Hudson Bay region to Michigan and Georgia.

ILLUSTRATIONS: Bot. Mag. pl. 331; Bot. Cab. pl. 502; Schkuhr, Handb. pl. 416; Britt. & Brown, Ill. Fl. f. 2756; ed. 2. f. 3228; Meehan, Nat. Fl. II. 2: pl. 45.

### 3. *Kalmia carolina* Small, Fl. SE. U. S. 886. 1903.

A shrub 1 m. tall or less, with permanently fine-pubescent twigs; leaf-blades oval to oblong, or oblong-lanceolate, 1.5–9 cm. long, obtuse or mucronulate, deep-green above, pale beneath, permanently canescent-tomentulose at least beneath, short-petioled; clusters many-flowered; pedicels puberulent and glandular, 1 cm. long or less; calyx 4–5 mm. wide, the lobes



lanceolate to oblong-lanceolate, somewhat acuminate, puberulent, and sometimes glandular; corolla pink or purple, 5–7 mm. wide; style sometimes finely pubescent; capsules spheroidal, 2.5–3.5 mm. wide, copiously puberulent, often pale, and somewhat glandular.

TYPE LOCALITY: Flat Rock, North Carolina.

DISTRIBUTION: Virginia to South Carolina.

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2. f. 3229.

4. ***Kalmia microphylla*** (Hook.) A. Heller, Bull. Torrey Club 25: 581.  
1898.

*Kalmia glauca microphylla* Hook. Fl. Bor. Am. 2: 41. 1834.

A diffuse-branched shrub 1–2 dm. tall or less, with glabrous or puberulent twigs; leaf-blades obovate, oval, or ovate, or sometimes broadly oblong, 0.5–2 cm. long, obtuse, glabrous, flat or nearly so, deep-green above, pale or glaucescent beneath, sessile or nearly so; clusters few-flowered; pedicels slender, glabrous, mostly 2.5–4 cm. long; calyx 5–6.5 mm. wide, the lobes oblong to ovate, obtuse; corolla lilac-purple or rose-purple, 8–12 mm. wide; capsules spheroidal, 5–6 mm. wide, glabrous.

TYPE LOCALITY: Rocky Mountains.

DISTRIBUTION: Yukon to Montana, Colorado, and California.

ILLUSTRATION: Brown & Schäffer, Alp. Pl. Can. pl. 61.

5. ***Kalmia occidentalis*** Small, sp. nov.

A branching shrub 1–3 dm. tall, with glaucous, glabrous twigs or these merely puberulent near the tips; leaf-blades oblong to oblong-lanceolate or oblong-ovate, mostly 1–3.5 cm. long, flat or slightly revolute, deep-green above, glaucous beneath, glabrous, sessile or very short-petioled; clusters few-several-flowered; pedicels stoutish, 2–3.5 cm. long, glabrous; calyx 8–10 cm. wide, the lobes of an oblong type, or individually ovate, obtuse; corolla rose-purple, 1.5–2 cm. wide; capsules spheroidal, 5.5–6.5 mm. wide, glabrous.

Type collected in the foothills of Mt. Rainier, Washington, 1883, *Mrs. Bailey Willis* (herb. Columbia Univ.).

DISTRIBUTION: Alaska to Washington.

6. ***Kalmia polifolia*** Wangenh. Beob. Ges. Nat. Freunde  
Berlin 2: 130. 1788.

*Kalmia glauca* Ait. Hort. Kew. 2: 64. 1789.

*Kalmia glauca rosmarinifolia* Pursh, Fl. Am. Sept. 296. 1814.

An erect or somewhat spreading shrub mostly 3–7 dm. tall, with glabrous or puberulent twigs; leaf-blades oblong to linear-oblong or oblong-lanceolate, often apparently narrow on account of the strongly revolute margins, mostly 2–3 cm. long, obtuse, glabrous, bright-green above, glaucous beneath, sessile or nearly so; clusters few-several-flowered; pedicels slender, glabrous, 2–3 cm. long; calyx 5–6 mm. wide, the lobes ovate to broadly oblong, obtuse; corolla rose-purple, 1–1.5 cm. wide; capsules spheroidal-ovoid or globose, 5–6 mm. wide, glabrous.

TYPE LOCALITY: Canada.

DISTRIBUTION: Labrador and Hudson Bay to Newfoundland, New Jersey, Pennsylvania, and Minnesota.

ILLUSTRATIONS: Beob. Ges. Nat. Freunde Berlin 2: pl. 5; Ait. Hort. Kew. 2: pl. 8; Meerb. Pl. Sel. pl. 21; Bot. Mag. pl. 177; Bot. Cab. pl. 1508; Lam. Tab. Encyc. pl. 363; Nouv. Duham. 1: pl. 45; Britt. & Brown, Ill. Fl. f. 2758; ed. 2. f. 3231; Goodale, Wild Fl. Am. pl. 18; Mathews, Field Book 335.

7. ***Kalmia latifolia*** L. Sp. Pl. 391. 1753.

An irregularly branched shrub or small tree, with sparingly glandular-pubescent twigs and clammy-pubescent inflorescence; leaf-blades elliptic or oval, varying to broadest above or below the middle, mostly 5–8 cm. long, acute or slightly acuminate at both ends, dark-green above, pale-green beneath, with the midrib prominent beneath, manifestly petioled; clusters usually many-flowered; pedicels slender, villous, or merely puberulent in age, 1–3.5 cm. long; calyx 7–8 mm. wide, the lobes oblong, oblong-ovate, or lanceolate, usually glandular-ciliate,

acute; corolla pink or white, 2–2.5 cm. wide, sticky; filaments finely pubescent, at least to above the middle; ovary glandular; capsules spheroidal, 5–7 mm. wide, glandular-viscid.

TYPE LOCALITY: Maryland.

DISTRIBUTION: New Brunswick and Ontario to Florida and Louisiana.

ILLUSTRATIONS: Bot. Mag. *pl.* 175; Schkuhr, Handb. *pl.* 116; Gaertn. Fruct. *pl.* 63; Michx. Hist. Arb. Am. 3<sup>3</sup>: *pl.* 5; Bigel. Am. Med. Bot. *pl.* 13; Lam. Tab. Encyc. *pl.* 363; Nouv. Duham. 1: *pl.* 44; Spach, Hist. Nat. Veg. *pl.* 139; Sarg. Silva *pl.* 236, 237; Britt. & Brown, Ill. Fl. f. 2757; ed. 2. f. 3230; Sarg. Man. f. 583; Britton, N. Am. Trees f. 690.

## 16. *KALMIELLA* Small, Fl. SE. U. S. 886. 1903.

Shrubs with erect or spreading irregular branches and rather coarsely pubescent foliage. Leaves alternate, often numerous, persistent; blades relatively small, thick, or leathery, entire or obscurely toothed, more or less revolute. Flowers solitary in the axils of the leaves, scattered or approximate and forming a terminal raceme. Calyx deciduous; sepals distinct or nearly so, narrow, somewhat foliaceous. Corolla resembling that of *Kalmia*. Stamens 10, about as long as the corolla or slightly shorter; filaments linear-filiform or subulate, glabrous; anthers oval or ovoid, opening by long pores, or ultimately lengthwise, discharging their pollen when drawn from the corolla-sacs by the elastically straightening filaments. Ovary 5-celled, depressed; style clavate or nearly filiform, nearly straight; stigma depressed. Capsule of an ovoid type, exceeded by the calyx before it falls away.

Type species, *Kalmia hirsuta* Walt.

Flowers scattered along the branches; leaf-blades broad, slightly revolute.

1. *K. hirsuta*.

Flowers aggregated at the ends of the branches; leaf-blades narrow, strongly revolute.

Filaments pubescent; leaf-blades glabrous above; inflorescence lax.

2. *K. ericoides*.

Filaments glabrous; leaf-blades glandular-pubescent above; inflorescence compact.

3. *K. aggregata*.

### 1. *Kalmiella hirsuta* (Walt.) Small, Fl. SE. U. S. 886. 1903.

*Kalmia hirsuta* Walt. Fl. Car. 138. 1788.

*Kalmia ciliata* Bartr.; Dum.-Cours. Bot. Cult. ed. 2. 3: 323. 1811.

A shrub 6 dm. tall or less, with hirsute foliage and spreading or ascending branches; leaf-blades thick, oblong, lanceolate, or oval-orbicular, 4–10 mm. long, acute or acutish, somewhat revolute, bright-green and shining above, pale-green and dull beneath, ciliate, nearly sessile; pedicels as long as the leaves or longer, loosely hirsute; sepals oblong-lanceolate or elliptic, acuminate, long-ciliate; corolla rose-purple or pink, 10–15 mm. broad; filaments pubescent near the base; capsules ovoid, about 3 mm. long.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Virginia to Florida and Alabama.

ILLUSTRATIONS: Bot. Mag. *pl.* 138; Bot. Cab. *pl.* 1058; Britt. & Brown, Ill. Fl. f. 2759; ed. 2. f. 3232; Lounsberry, S. Wild Fl. *pl.* 126.

### 2. *Kalmiella ericoides* (C. Wright) Small.

*Kalmia ericoides* C. Wright; Griseb. Cat. Pl. Cub. 51. 1856.

A low shrub, with pilose and more or less glandular foliage and mostly ascending branches; leaf-blades thick, subulate or lanceolate-subulate on account of the strongly revolute margins, 3–9 mm. long, acute, bright-green and shining above, dull beneath, barely ciliate, nearly sessile; pedicels ultimately mostly longer than the leaves, glandular-pilose; sepals lanceolate to ovate-lanceolate, 4–5 mm. long, somewhat acuminate or acute, long-ciliate; corolla deep-pink, 12–14 mm. broad; filaments pubescent near the base; capsules broadly ovoid, 2.5–3 mm. long.

TYPE LOCALITY: La Grifa, Cuba.

DISTRIBUTION: Western Cuba.

### 3. *Kalmiella aggregata* Small, sp. nov.

A shrub 12 dm. tall or less, with erect or nearly erect branches and both finely pubescent and somewhat short-hirsute foliage; leaf-blades very thick, narrowly ovate to lanceolate, or narrower on account of the strongly revolute margins, 8–11 mm. long, obtuse or acutish,



deep-green and finely pubescent above, paler and finely pubescent beneath, barely ciliate, sessile; pedicels shorter than the leaves, minutely pubescent and glandular-pilose; sepals lanceolate to oblong-lanceolate, acute or slightly acuminate, copiously soft-ciliate with gland-tipped hairs; corolla light-pink, 17–20 mm. broad; filaments glabrous; capsules not seen.

Type collected in pinelands, Los Indios, Isle of Pines, Cuba, May 17, 1910, *Jennings 324* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Isle of Pines, Cuba.

## 17. CHAMAEDAPHNE Moench, Meth. 457. 1794.

*Cassandra* D. Don, Edinb. New Phil. Jour. 17: 158. 1834.

Shrubs with irregularly branching stems. Leaves alternate; blades leathery, slightly toothed, petioled. Flowers perfect, in one-sided leafy-bracted racemes. Calyx stellate, subtended by 2 bractlets; lobes 5, much longer than the tube, persistent. Corolla urceolate, white; lobes 5, recurved, much shorter than the tube. Stamens 10, included; filaments subulate, glabrous, adnate to the base of the corolla; anthers shorter than the filaments, the sacs awnless, prolonged into tubes which open by terminal pores. Disk 10-lobed. Ovary 5-celled, 5-grooved; style elongate; stigma entire. Ovules numerous in each cavity. Capsule depressed, loculicidally 5-valved, the sutures not thickened.

Type species, *Andromeda calyculata* L.

### 1. Chamaedaphne calyculata (L.) Moench, Meth. 457. 1794.

*Andromeda calyculata* L. Sp. Pl. 394. 1753.

*Lyonia calyculata* Reichenb. Fl. Germ. Excurs. 414. 1830.

*Cassandra calyculata* D. Don, Edinb. New Phil. Jour. 17: 158. 1834.

Shrub asymmetrical, 1–15 dm. tall, with scurfy foliage; leaf-blades oblong, elliptic, obovate, or oblanceolate, 1–5 cm. long, obtuse or acute, serrulate or erose, narrowed into very short petioles; racemes 2–12 cm. long, conspicuously bracted; bracts similar to the leaves but smaller; pedicels 1–3 mm. long; calyx-lobes triangular or triangular-ovate, 1.5–2 mm. long, or rarely longer, acute; corolla white, 6–7 mm. long, the lobes ovate, obtuse; capsules spheroidal-angular, 4 mm. broad.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Newfoundland to Alaska, south to Georgia, Illinois, and British Columbia; also in northern Europe and Asia.

ILLUSTRATIONS: Pall. Fl. Ross. *pl.* 72; Lam. Tab. Encyc. *pl.* 365; Sv. Bot. *pl.* 583; Reichenb. Fl. Germ. 17: *pl.* 1161; Britt. & Brown, Ill. Fl. *f.* 2772; ed. 2. *f.* 3236; Meehan, Nat. Fl. 1: *pl.* 32.

## 18. EUBOTRYS Nutt. Trans. Am. Phil. Soc. II. 8: 269. 1843.

Shrubs with erect or ascending rigid stems, the branches usually spreading. Leaves alternate, deciduous; blades relatively broad, thinnish, finely toothed, petioled. Flowers perfect, in secund terminal raceme-like panicles which are partly formed the preceding summer. Calyx stellate; lobes 5, narrow or rather broad, very much longer than the tube. Corolla narrowly urceolate, much longer than the calyx, the lobes much shorter than the tube. Stamens 10, included; filaments subulate, lanceolate, or linear, glabrous, straight; anthers narrow, the sacs 1- or 2-awned at the apex. Ovary 5-celled, lobed, depressed; style columnar, straight; stigma slightly dilated, obscurely lobed. Capsule depressed, thick-walled, obscurely or prominently lobed, 5-valved, septicidal.

Type species, *Andromeda racemosa* L.

Capsules not lobed; seeds wingless; panicles straight or nearly so.

Calyx-lobes of an ovate type, less than  $\frac{1}{2}$  as long as the corolla; capsule exceeding the calyx.

Calyx-lobes of a lanceolate type,  $\frac{1}{2}$  as long as the corolla or longer; capsule shorter than the calyx.

Capsules lobed; seeds winged; panicles curved.

1. *E. racemosa*.

2. *E. elongata*.

3. *E. recurva*.

### 1. Eubotrys racemosa (L.) Nutt. Trans. Am. Phil. Soc. II. 8: 269. 1843.

*Andromeda racemosa* L. Sp. Pl. 394. 1753.

*Leucothoe racemosa* A. Gray, Man. ed. 2. 252. 1856.

A wide-branching shrub 1–4 m. tall, with glabrous or puberulent twigs; leaves firm, the blades oblong or elliptic, varying to obovate, 2–7 cm. long, acute or slightly acuminate, serru-

late; glabrous or sparingly fine-pubescent, short-petioled; panicles 3–10 cm. long, simple or branched; pedicels 1–2 mm. long; calyx glabrous, the lobes ovate to triangular, sometimes becoming triangular-lanceolate, 2–3 mm. long, acute, ciliolate; corolla white or pink, 8–9 mm. long, nearly cylindric below the constricted throat, the lobes ovate, recurved; anther-sacs about 1.5 mm. long, each with 2 subulate awns; capsules spheroidal, 4 mm. broad, surpassing the calyx.

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Mainly in the coastal plain, Massachusetts to Florida and Louisiana.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2766; ed. 2. f. 3240.

## 2. *Eubotrys elongata* Small.

*Leucothoe elongata* Small, Bull. N. Y. Bot. Gard. 1: 284. 1899.

A branching shrub 1–3 m. tall, with puberulent or fine-pubescent foliage; leaves firm, the blades oblong or elliptic, or sometimes oblong-oblong-oblanceolate or oblong-obovate, 2–5 cm. long, acute or slightly acuminate, serrulate, usually copiously fine-pubescent, gradually or abruptly narrowed into short petioles; panicles 10–20 cm. long; pedicels 1.5–3 mm. long; calyx usually puberulent, the lobes lanceolate, often narrowly so, 3–4.5 mm. long, acuminate, ciliolate; corolla white or pinkish, 7–8 mm. long, nearly cylindric below the somewhat constricted throat, the lobes ovate, recurved; anther-sacs about 1.5 mm. long, each with 2 subulate awns; capsules spheroidal, 3.5–4 mm. broad, shorter than the sepals.

TYPE LOCALITY: Florida.

DISTRIBUTION: Coastal plain, Virginia to Florida and Louisiana.

## 3. *Eubotrys recurva* (Buckl.) Britton; Britt. & Brown, Ill. Fl. ed. 2. 2: 688. 1913.

*Andromeda recurva* Buckl. Am. Jour. Sci. 45: 172. 1843.

*Leucothoe recurva* A. Gray, Man. ed. 2: 252. 1856.

A widely branching shrub 1–4 m. tall, with glabrate or minutely pubescent foliage; leaves deciduous, the blades thinnish but often rather firm, oval or elliptic, varying to ovate or obovate, 4–10 cm. long, acute or short-acuminate, serrate, rather abruptly narrowed or rarely rounded at the base, short-petioled; panicles 2–10 cm. long, simple or branching, often many-flowered; pedicels stout, 1–2 mm. long; calyx glabrous, the lobes oblong-ovate or ovate, 2–3 mm. long, acute, involute; corolla white, 6–8 mm. long, oblong-cylindric, the lobes ovate recurved; anthers nearly 2 mm. long, each sac with a slender awn; capsules spheroidal, 5–6 mm. broad, lobed.

TYPE LOCALITY: Mountains near Paint Rock, Tennessee.

DISTRIBUTION: In the mountains, Virginia and Tennessee to Georgia, and said to occur in Alabama.

ILLUSTRATIONS: Garden & Forest 9: 225; Britt. & Brown, Ill. Fl. f. 2765; ed. 2. f. 3239; Lounsberry, S. Wild Fl. pl. 128; Ic. Hort. Tennesis pl. 40.

## 19. *LEUCOTHOE* D. Don, Edinb. New Phil. Jour. 17: 159. 1834.

Shrubs with arching or erect usually pliable stems and branches. Leaves alternate, persistent; blades leathery, entire or toothed, petioled. Flowers perfect, in axillary, short, one-sided, spreading or curved, raceme-like, spike-like, or corymb-like panicles. Calyx stellate; lobes usually 5, broad and short, much longer than the tube. Corolla white or nearly so, urceolate, much longer than the calyx, the lobes much shorter than the tube. Stamens 10, included; filaments subulate to lanceolate, often pubescent; anthers oblong, oval, or subglobose, the sacs awnless, but obscurely or prominently bimucronate. Ovary 5-celled, lobed, depressed; style columnar, straight or nearly so; stigma slightly dilated, somewhat lobed. Capsule depressed, thick-walled, slightly 5-lobed, 5-valved, septicidal.

Type species, *Andromeda axillaris* Lam.

Filaments scabrous or short-pubescent, straight or nearly so; anthers prominently bimucronate.

Calyx-lobes strongly imbricate in anthesis; leaf-blades abruptly pointed or short-acuminate.

Calyx-lobes scarcely imbricate in anthesis; leaf-blades long-acuminate.

Filaments villous, sigmoid-curved above; anthers obscurely bimucronate.

Twigs pale; leaf-blades reticulate, acute or short-acuminate.

Twigs dark; leaf-blades not reticulate, long or caudate-acuminate.

1. *L. axillaris*.

2. *L. Catesbaei*.

3. *L. acuminata*.

4. *L. mexicana*.



1. *Leucothoe axillaris* (Lam.) D. Don, Edinb. New Phil. Jour.  
17: 159. 1834.

*Andromeda axillaris* Lam. Encyc. 1: 157. 1783.

*Lyonia axillaris* K. Koch, Dendr. 2<sup>1</sup>: 124. 1872.

*Leucothoe platyphylla* Small, Fl. SE. U. S. 886. 1903.

An evergreen shrub 1–2 m. tall, with puberulent twigs; leaf-blades leathery, oblong or oblong-lanceolate, or oval to suborbicular, 4–15 cm. long, abruptly acute or short-acuminate, rather remotely serrate, slightly revolute, often sparingly pubescent beneath, acute to rounded at the base, the petioles 0.5–1 cm. long; panicles axillary, 2–7 cm. long, densely flowered; bracts broadly ovate, 2–3 mm. long, acute; pedicels 1–4 mm. long, minutely pubescent; calyx 5–6 mm. broad, the lobes ovate to orbicular-ovate, 2 mm. long, acute; corolla white, cylindric-ovoid, 6–7 mm. long; capsules spheroidal, 6–7 mm. broad.

TYPE LOCALITY: North America.

DISTRIBUTION: Virginia to Florida and Mississippi.

ILLUSTRATIONS: Lam. Tab. Encyc. *pl.* 365; Britt. & Brown, Ill. Fl. f. 2763; ed. 2. f. 3237.

2. *Leucothoe Catesbaei* (Walt.) A. Gray, Man. ed. 2. 252. 1856.

*Andromeda Catesbaei* Walt. Fl. Car. 137. 1788.

*Andromeda spinulosa* Pursh, Fl. Am. Sept. 293. 1814.

? *Andromeda lanceolata* Desf. Cat. ed. 3. 398. 1829.

*Leucothoe spinulosa* G. Don, Gen. Hist. 3: 832. 1834.

*Lyonia Catesbaei* K. Koch, Dendr. 2<sup>1</sup>: 125. 1872.

An evergreen shrub 1–2 m. tall, with glabrous or sparingly fine-pubescent twigs, the stems and branches often recurved or reclining; leaf-blades leathery, lanceolate to narrowly elliptic, 6–15 cm. long, long-acuminate, serrate with spine-tipped teeth, lustrous above, acute or rounded at the base, the petioles 1–1.5 cm. long; panicles axillary, narrow, 4–8 cm. long, simple; bracts broadly ovate, acute, 4–5 mm. long; pedicels 4–8 mm. long; calyx about 5 mm. broad, the lobes ovate, about 2 mm. long, acute; corolla white or pinkish, cylindric-ovoid, 5–6 mm. long; capsules spheroidal, about 5 mm. broad.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Virginia and Tennessee to Georgia.

ILLUSTRATIONS: Bot. Mag. *pl.* 1955; Bot. Cab. *pl.* 1320; Britt. & Brown, Ill. Fl. f. 2764; ed. 2. f. 3238; Lounsberry, S. Wild Fl. *pl.* 127.

3. *Leucothoe acuminata* (Ait.) G. Don, Gen. Hist. 3: 834. 1834.

? *Andromeda populifolia* Lam. Encyc. 1: 159. 1783.

? *Andromeda lucida* Jacq. Coll. 1: 95. 1786.

? *Andromeda reticulata* Walt. Fl. Car. 137. 1788.

*Andromeda acuminata* Ait. Hort. Kew. 2: 70. 1789.

*Andromeda laurina* Michx. Fl. Bor. Am. 1: 253. 1803.

An evergreen shrub 1–4 m. tall, with glabrous or sparingly pubescent twigs and hollow branches; leaf-blades leathery, lanceolate to ovate-lanceolate or ovate, 3–10 cm. long, acute or usually acuminate, entire or obscurely toothed, finely reticulate, abruptly narrowed or rounded at the base, the petioles less than 1 cm. long; panicles corymb-like, axillary, 1–3 cm. long, few-flowered; calyx puberulent, 4–5 mm. broad, the lobes broadly ovate, acute; corolla oblong-cylindric, 8–10 mm. long; capsules spheroidal, 5–6 mm. broad.

TYPE LOCALITY: North America.

DISTRIBUTION: South Carolina to Florida.

ILLUSTRATIONS: Jacq. Ic. Pl. Rar. *pl.* 79 (?); Smith, Exot. Bot. *pl.* 89.

4. *Leucothoe mexicana* (Hemsl.) Small.

*Andromeda mexicana* Hemsl. Biol. Centr. Am. Bot. 2: 282. 1881.

An evergreen (?) shrub with slender branches, the twigs puberulent or glabrous; leaf-blades thin-leathery, lanceolate to oblong-lanceolate, 2.5–5 cm. long, long-acuminate or caudate-acuminate, entire, not reticulate, green, darker above than beneath and somewhat shining, cuneate to rounded at the base, slender-petioled; panicles corymb-like, axillary, mostly 1–2 cm. long, few-flowered; calyx sparingly pubescent, 4–4.5 mm. wide, the lobes deltoid-ovate to reniform-ovate, acute or abruptly short-acuminate; corolla cylindric-urceolate, 9–12 mm. long; capsules spheroidal, 5–6 mm. broad.

TYPE LOCALITY: Sierra San Pedro Molasco, Mexico.

DISTRIBUTION: Mountains of southern Mexico and Guatemala.

## 20. OREOCALLIS Small, gen. nov.

Shrubs with erect or ascending stems. Leaves alternate, persistent; blades somewhat leathery, entire or slightly toothed, petioled. Flowers perfect, in elongate raceme-like panicles, these terminal and from the adjacent leaf-axils, forming a terminal compound panicle. Calyx stellate; lobes 5, narrow, much longer than the tube. Corolla white or nearly so, urceolate, much longer than the calyx, nodding, the lobes much shorter than the tube. Stamens 10, included; filaments subulate, glabrous; anthers oblong, the sacs awnless, but bimucronate at the apex. Ovary 5-celled, somewhat lobed, depressed; style slender-columnar, straight; stigma slightly dilated and lobed. Capsule depressed, thin-walled, prominently 5-lobed, 5-valved, septicidal.

Type species, *Leucothoe Davisiae* Torr.

### 1. *Oreocallis Davisiae* (Torr.) Small.

*Leucothoe Davisiae* Torr.; A. Gray, Proc. Am. Acad. 7: 400. 1868.

? *Leucothoe Cusickii* M. E. Jones, Contr. West. Bot. 11: 1. 1903.

A shrub with glabrous or puberulent twigs and inflorescence; leaf-blades oblong, oval, or oval-ovate, 2–7 cm. long, obtuse, mucronate or acute, deep-green and shining above, paler and dull beneath, glabrous, abruptly narrowed or rounded at the base, short-petioled; panicles mostly about 1 dm. long; calyx 6–7 mm. wide, the lobes oblong to lanceolate, acute or obtuse, nearly glabrous; corolla 7–8 mm. long, the lobes ovate, recurved; stamens 5–5.5 mm. long, the filaments glabrous; style glabrous; capsules spheroidal, 5–6 mm. in diameter, smooth and glabrous.

TYPE LOCALITY: Nevada county, near Eureka, California.

DISTRIBUTION: Oregon and California.

ILLUSTRATION: Bot. Mag. pl. 6247.

## 21. OXYDENDRUM DC. Prodr. 7: 601. 1839.

Trees with furrowed bark and ascending terete branches. Leaves alternate, deciduous; blades rather broad, thinnish, toothed, petioled. Flowers numerous, in graceful expanding secund compound panicle-like racemes, drooping. Calyx persistent; lobes 5, rather narrow, several times as long as the short tube. Corolla ovoid or conic-ovoid, white; lobes 5, short, recurved from the very narrow mouth. Stamens 10, included; filaments short, somewhat dilated; anthers narrow, as long as the filaments or longer, awnless. Ovary 5-lobed, ovoid or globular; style slender-columnar, not thickened at the base; stigma minute. Capsule erect, ovoid, slightly angled, loculicidally 5-valved, seated in the calyx.

Type species, *Andromeda arborea* L.

### 1. *Oxydendrum arboreum* (L.) DC. Prodr. 7: 601. 1839.

*Andromeda arborea* L. Sp. Pl. 394. 1753.

*Lyonia arborea* D. Don, Edinb. New Phil. Jour. 17: 159. 1834.

A tree sometimes 25 m. tall, with glabrous or sparingly puberulent twigs; leaf-blades oblong, elliptic, or oval, or sometimes oblong-lanceolate, 8–20 cm. long, acuminate, sometimes short-acuminate, finely serrate, shining above, paler and sometimes glaucescent beneath, and also puberulent and sparingly pubescent on the veins, especially when young, acute or abruptly narrowed at the base, rather slender-petioled; panicles mostly 1–2 dm. long, the branches distichous, puberulent; pedicels drooping in anthesis, erect in fruit; calyx-lobes ovate to lanceolate, 3–4 mm. long, acuminate; corolla wax-like, 6–7 mm. long, constricted at the throat, the lobes obtuse to mucronulate; stamens 5–6 mm. long; capsules ovoid, sometimes narrowly so, 4–5 mm. long, usually slightly constricted below the apex, canescent.

TYPE LOCALITY: Virginia.

DISTRIBUTION: In or near the mountains, Pennsylvania and Ohio to Florida and Mississippi.

ILLUSTRATIONS: Bot. Mag. pl. 905; Michx. Hist. Arb. Am. 3<sup>3</sup>: pl. 7; Raf. Med. Fl. pl. 5; Bot. Cab. pl. 1210; W. Barton, Fl. N. Am. pl. 30; Sarg. Silva pl. 235; Britt. & Brown, Ill. Fl. f. 2773; ed. 2. f. 3246; J. E. Rogers, Tree Book, opp. 417; Britton, N. Am. Trees f. 692; Sarg. Man. f. 584; Hough, Trees f. 440.



**22. CASSIOPE** D. Don, Edinb. New Phil. Jour. 17: 157. 1834.

Shrubs with creeping, prostrate, or ascending, more or less matted stems and branches. Leaves 4-ranked, imbricate and clothing the branches; blades broad, short and very thick, rounded, keeled or grooved on the back, sessile or nearly so. Flowers perfect, solitary at the ends of lateral pedicels, nodding. Calyx persistent; lobes 4 or 5, usually obtuse or rounded, many times as long as the very short tube. Corolla white or pink, campanulate; tube broad; lobes 4 or 5, rounded, much shorter than the tube. Stamens 8 or 10, included; filaments short, sometimes dilated at the base; anthers globular or slightly elongate, each sac with a slender awn. Ovary globular or depressed, 5-celled; style slender, scarcely or not at all thickened at the base, somewhat persistent; stigma minute. Capsule globose or oval, varying to ovoid or obovoid, 5-lobed, loculidically 5-valved, seated in the shorter calyx.

Type species, *Andromeda tetragona* L.

Leaf-blades grooved on the back.

Flowers long-pedicelled; pedicels several times as long as the leaves in anthesis, much longer in fruit; corolla 3–4 mm. long.

Flowers short-pedicelled; pedicels about as long as the leaves in anthesis, twice or thrice as long in fruit; corolla 6–7 mm. long.

Leaf-blades not grooved on the back.

Leaf-blades not scarious-margined, the young ones ciliate at the tip; filaments scarcely dilated at the base.

Leaf-blades scarious-margined, not ciliate; filaments decidedly dilated at the base.

1. *C. tetragona*.

2. *C. saximontana*.

3. *C. Mertensiana*.

4. *C. lycopodioides*.

**1. Cassiope tetragona** (L.) D. Don, Edinb. New Phil. Jour. 17: 158.  
1834.

*Andromeda tetragona* L. Sp. Pl. 393. 1753.

Shrub 0.5–3 dm. tall, with very stout branches; leaf-blades oblong-ovoid, 3.5–5.5 mm. long, usually obtusish, puberulent when young, grooved on the back; pedicels several times as long as the leaves in anthesis; calyx-lobes ovate, 2–2.5 mm. long, obtuse; corolla 5–6 mm. long, the lobes ovate; stamens about 2 mm. long; capsules globose-ovoid, about 3 mm. long.

TYPE LOCALITY: Lapland.

DISTRIBUTION: Circumboreal, southward to Labrador, the Hudson Bay region, and Alaska.

ILLUSTRATIONS: L. Fl. Lapp. *pl.* 1; Pall. Fl. Ross. *pl.* 73, *f.* 3; Fl. Dan. *pl.* 1030; Bot. Mag. *pl.* 3181; Britt. & Brown, Ill. Fl. *f.* 2762; ed. 2. *f.* 3234; Proc. Wash. Acad. 3: *f.* 64.

**2. Cassiope saximontana** Small, sp. nov.

Shrub mostly 1–2 dm. tall, with more slender branches than *C. tetragona*; leaf-blades narrowly ovoid, 4–5 mm. long, usually acute or acutish, puberulent when young, grooved on the back; pedicels about as long as the leaves in anthesis; calyx-lobes ovate or oblong-ovate, 2–2.5 mm. long, obtuse or acutish; corolla 3.5–4 mm. long, the lobes half-orbicular; stamens less than 2 mm. long; capsules ovoid, about 3 mm. long.

Type collected in open woods near the summit of Sulphur Mountain near Banff, Alberta, Canada, July 18, 1899, *W. G. McCalla 2161* (Herb. N. Y. Bot. Gard.).

DISTRIBUTION: Alberta.

**3. Cassiope Mertensiana** (Bong.) G. Don, Gen. Hist. 3: 829. 1834.

*Andromeda Mertensiana* Bong. Mém. Acad. St.-Petersb. VI. 2: 152. 1831.

*Andromeda cupressina* Hook. Fl. Bor. Am. 2: 38. 1834.

*Cassiope Mertensiana gracilis* Piper, Smithson. Misc. Coll. 50: 195. 1908.

*Cassiope Mertensiana ciliolata* Piper, Smithson. Misc. Coll. 50: 196. 1908.

*Cassiope Mertensiana californica* Piper, Smithson. Misc. Coll. 50: 196. 1908.

Shrub mostly 1–3 dm. tall, with stout ascending branches; leaf-blades ovate to lanceolate in outline, 4–6 mm. long, obtuse, glabrous or minutely ciliolate, not grooved on the back, but keeled; pedicels many times as long as the leaves; calyx-lobes ovate, 2–3.5 mm. long, obtuse, entire or erose; corolla 4–6 mm. long, the lobes ovate; stamens 2–2.5 mm. long; capsules obovoid to oval, 2.5–3.5 mm. long.

TYPE LOCALITY: Sitka.

DISTRIBUTION: Alaska to Montana, Nevada, and California.

ILLUSTRATIONS: Mém. Acad. St.-Petersb. VI. 2: *pl.* 5; Proc. Wash. Acad. 3: *f.* 63; Henshaw, Mountain Fl. Am. *pl.* 25; Brown & Schäffer, Alp. Pl. Can. *pl.* 59, *c.*

4. **Cassiope lycopodioides** (Pall.) D. Don, Edinb. New Phil. Jour.  
17: 158. 1834.

*Andromeda lycopodioides* Pall. Fl. Ross. 1<sup>2</sup>: 58. 1788.

Shrub less than 1 dm. tall, with prostrate or creeping slender branches; leaf-blades ovate, 1–1.5 mm. long, obtuse or acutish, scarious-margined, bearded at the apex, at least when young, rounded on the back; pedicels many times as long as the leaves; calyx-lobes broadly ovate to suborbicular, 2.5–3 mm. long, rounded at the apex, erose; corolla 5–6 mm. long; lobes broadly ovate; stamens about 2 mm. long; capsules ovoid, about 3 mm. long.

TYPE LOCALITY: Shores of the Sea of Okhotsk, Kamtchatka.

DISTRIBUTION: Alaska; also in eastern Asia to Japan.

ILLUSTRATIONS: Pall. Fl. Ross. *pl.* 73, *f.* 1; Proc. Wash. Acad. 3: *f.* 65.

23. **HARRIMANELLA** Coville, Proc. Wash. Acad. Sci. 3: 570.  
1901.

Shrubs with matted, tufted, or depressed diffuse stems and branches. Leaves alternate, persistent, approximate, crowded or imbricate; blades narrow, erose or minutely toothed, often very thick, sessile or very short-petioled. Flowers perfect, solitary at the ends of the branches, pedicelled, nodding. Calyx persistent; lobes usually 5, acute or rounded, many times as long as the very short tube. Corolla white or pink, campanulate; tube broad; lobes usually 5, rounded, as long as the tube or longer. Stamens mostly 10, included: filaments short, swollen at the base; anthers didymous, each sac with a slender awn. Ovary about as wide as long, 5-celled; style ovoid or conic, persistent; stigma minute. Ovules numerous. Capsule globose or ovoid-globose, 5-lobed, loculicidally 5-valved, seated in the shorter calyx.

Type species, *Andromeda Stelleriana* Pall.

Calyx-lobes acute; corolla-lobes about as long as the tube; leaves appressed, the blades of a subulate type.

1. *H. hypnoides*.

Calyx-lobes obtuse; corolla-lobes much longer than the tube; leaves spreading, the blades of an oblong or cuneate type.

2. *H. Stelleriana*.

1. **Harrimanella hypnoides** (L.) Coville, Proc. Wash. Acad. Sci. 3:  
575. 1901.

*Andromeda hypnoides* L. Sp. Pl. 393. 1753.

*Cassiope hypnoides* D. Don, Edinb. New Phil. Jour. 17: 158. 1834.

Plants in low tufts or patches, the stems and branches resembling plants of *Polytrichum*; leaves loosely imbricate, 2–4 mm. long, the blades linear-subulate to subulate, acute, ciliolate; pedicels slender, mostly 1–1.5 cm. long, puberulent, several times as long as the leaves; calyx 4–4.5 mm. wide, the lobes ovate, acute; corolla 4–5 mm. long, the lobes about as long as the tube, ovate or half-orbicular; stamens 1.3–1.5 mm. long; capsules globose-ovoid, 2.5–3.5 mm. long.

TYPE LOCALITY: Lapland.

DISTRIBUTION: Greenland and Baffin Land to Labrador, Maine, the White Mountains of New Hampshire, and the high mountains of New York; also in northern Europe and northern Asia.

ILLUSTRATIONS: L. Fl. Lapp. *pl.* 1, *f.* 3; Fl. Dan. *pl.* 10; Pall. Fl. Ross. *pl.* 73, *f.* 2; Bot. Mag. *pl.* 2936; E. & P. Nat. Pfl. 4<sup>1</sup>: *f.* 12a; Britt. & Brown, Ill. Fl. *f.* 2761; ed. 2. *f.* 3235; Proc. Wash. Acad. Sci. 3: *f.* 66.

2. **Harrimanella Stelleriana** (Pall.) Coville, Proc. Wash. Acad. Sci. 3:  
574. 1901.

*Andromeda Stelleriana* Pall. Fl. Ross. 1<sup>2</sup>: 58. 1788.

*Erica Stelleriana* Willd. Sp. Pl. 2: 387. 1799.

*Andromeda empetrifolia* Mert.; Bong. Mém. Acad. St.-Pétersb. VI. 2: 153. 1831.

*Bryanthus Stelleri* D. Don, Edinb. New Phil. Jour. 17: 160. 1834.

*Menziesia Stelleriana* Fisch.; Hook. Fl. Bor. Am. 2: 37. 1834.

*Cassiope Stelleriana* DC. Prodr. 7: 611. 1839.

Plants in diffuse mats, the stems and branches resembling those of *Empetrum*; leaves approximate or crowded, spreading, 1.5–3.5 mm. long, the blades oblong, narrowly oblong, or cuneate, obtuse or acutish, erose; pedicels stout, about as long as the leaves or shorter in



anthesis, about twice as long as the leaves in fruit; calyx 7–8 mm. wide, the lobes oval or oblong, obtuse; corolla 6–7 mm. long, the lobes much longer than the tube, suborbicular; stamens 2.5–3 mm. long; capsules subglobose, 4–5 mm. long.

TYPE LOCALITY: Eastern Siberia.

DISTRIBUTION: Alaska to Washington; also from eastern Siberia to northern Japan.

ILLUSTRATIONS: Pall. Fl. Ross. *pl.* 74, *f.* 2; Hook. Fl. Bor. Am. *pl.* 131; Harriman Alaska Exp. 1: 32; Proc. Wash. Acad. Sci. 3: *f.* 62.

## 24. ANDROMEDA L. Sp. Pl. 393. 1753.

Shrubs with low branching stems. Leaves alternate, persistent; blades broad or narrow, entire, revolute, sessile or nearly so. Flowers perfect, in cluster-like racemes or panicles. Calyx stellate; lobes 5, broad, about as long as the tube or longer. Corolla urceolate, white or pink, the lobes short and broad, recurved. Stamens 10, included; filaments short, often lanceolate, pubescent, unappendaged; anthers oval, shorter than the filaments, each sac with 1 or 2 slender awns. Ovary 5-celled, globular or depressed, slightly lobed; style slender-columnar; stigma minute, obscurely lobed. Capsule slightly elongate or slightly depressed, 5-valved, septicidal, the sutures not thickened.

Types species, *Andromeda Polifolia* L.

Leaf-blades glaucous beneath; pedicels several times as long as the corolla or capsule.

1. *A. Polifolia*.

Leaf-blades canescent beneath; pedicels once or twice as long as the corolla or capsule.

2. *A. canescens*.

### 1. *Andromeda Polifolia* L. Sp. Pl. 393. 1753.

*Andromeda glaucophylla* Link, Enum. 1: 394. 1821.

A low shrub with branching stems arising from creeping or horizontal rootstocks; leaf-blades oblong to linear, or rarely oval, mostly 1–3 cm. long, usually acute, often strongly revolute, bright-green above, glaucous beneath, glabrous; flowers in erect lax clusters on erect branchlets; pedicels long, mostly 1–2 cm. long, slender, straight; calyx 4–5 mm. wide, the lobes ovate to triangular, acute or acutish, usually reddish or pale, and ascending; corolla white or pink, 6–7 mm. long; capsules globose to obovoid, in lax clusters.

TYPE LOCALITY: Europe.

DISTRIBUTION: Arctic America southward to Quebec, the Great Lake region, and Idaho. Also in northern Europe and Asia.

ILLUSTRATIONS: L. Fl. Lapp. *pl.* 1; Fl. Dan. *pl.* 54; Pall. Fl. Ross. *pl.* 71; Schkuhr, Handb. *pl.* 118; Lam. Tab. Encyc. *pl.* 365; Sv. Bot. *pl.* 445; Sturm, Fl. Deuts. 20: *pl.* 94; Hayne, Arzn.-Gew. 3: *pl.* 22; Bot. Cab. *pl.* 1714; Baxter, Brit. Bot. 5: *pl.* 361; Reichenb. Fl. Germ. *pl.* 1161; Britt. & Brown, Ill. Fl. *f.* 2767; ed. 2. *f.* 3241; Rob. & Fern. Man. *f.* 844.

### 2. *Andromeda canescens* Small, sp. nov.

?*Andromeda Polifolia latifolia* Lodd. Bot. Cab. *pl.* 546. 1821.

A shrub similar to *A. Polifolia* in habit; leaf-blades usually relatively narrower and more revolute, mostly 2–5 cm. long, acute, bright-green above, closely fine-canescant beneath; flowers in nodding rather dense clusters on curved branchlets; pedicels short, mostly less than 1 cm. long, stout, curved; calyx 3–4 mm. wide, the lobes usually triangular, acute, usually whitish and spreading; corolla pink or pinkish, 4–6 mm. long; capsules spheroidal, in dense clusters.

Type collected at Chilson Lake, New York, August 30, 1900, N. L. & E. G. Britton (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Newfoundland and Labrador to Manitoba, New Jersey, Indiana, and Minnesota.

ILLUSTRATIONS: Bot. Cab. *pl.* 546 (?); Am. Jour. Sci. 3: *pl.* 1 (?); Rob. & Fern. Man. *f.* 845 (as *A. glaucophylla*).

## 25. ZENOBIA D. Don, Edinb. New Phil. Jour. 17: 158. 1834.

Shrubs with glabrous or glaucous foliage, the branches terete, erect or nearly so. Leaves alternate, deciduous; blades usually broad, entire or shallowly and irregularly toothed, reticulate, flat or nearly so. Flowers perfect, in axillary or lateral clusters borne on an elongate, sometimes virgate rachis. Calyx persistent; lobes 5, manifestly united at the base, broad,

often abruptly pointed. Corolla white or pink, often campanulate; tube broad; lobes 5, rounded, shorter than the tube. Stamens 10, included; filaments dilated at the base, unappendaged; anthers narrow, each sac with 2 slender awns. Disk 10-lobed. Ovary depressed, 5-celled; style columnar, or nearly so; stigma entire, minute. Ovules numerous. Capsule depressed, 5-lobed, loculicidally 5-valved, seated in the shorter calyx.

Type species, *Andromeda speciosa* Michx.

Pedicels and lower surface of the leaf-blades green; calyx less than 7 mm. wide.

1. *Z. cassinefolia*.

Pedicels and lower surface of the leaf-blades densely glaucous; calyx more than 7 mm. wide.

2. *Z. pulverulenta*.

1. *Zenobia cassinefolia* (Vent.) Pollard, Bull. Torrey Club 22: 231. 1895.

*Andromeda cassinefolia* Vent. Descr. Pl. Cels *pl.* 60. 1802.

*Andromeda nitida* Sims, Bot. Mag. *pl.* 970. 1803. Not *A. nitida* Bartr. 1788.

*Andromeda speciosa* Michx. Fl. Bor. Am. 1: 256. 1803.

*Zenobia speciosa* D. Don, Edinb. New Phil. Jour. 17: 158. 1834.

A branching shrub 1–2 m. tall, with glabrous foliage; leaves deep-green, the blades oblong or oval, varying towards ovate or obovate, 2–7 cm. long, leathery, acute, rounded, or retuse at the apex, reticulate, irregularly and shallowly serrate or crenate, narrowed into short petioles; flower-clusters in racemes 1–3 dm. long, the rachis zigzag; pedicels 1–2 cm. long; calyx 5–6 mm. broad, the lobes ovate or triangular-ovate, abruptly pointed; corolla white, campanulate, 6–8 mm. long or sometimes larger; capsules spheroidal, 5–6 mm. wide, green.

TYPE LOCALITY: Florida.

DISTRIBUTION: North Carolina and South Carolina. Both species of *Zenobia* have been recorded from Florida, but we have seen no specimens from south of South Carolina.

ILLUSTRATIONS: Vent. Descr. Pl. Cels *pl.* 60; Bot. Mag. *pl.* 970; Sweet, Br. Fl. Gard. II. *pl.* 330.

2. *Zenobia pulverulenta* (Bartr.) Pollard, Bull. Torrey Club 22: 232. 1895.

*Andromeda pulverulenta* Bartr.; Willd. Sp. Pl. 2: 610. 1799.

*Andromeda speciosa pulverulenta* Michx. Fl. Bor. Am. 1: 256. 1803.

*Andromeda cassinefolia pulverulenta* Vent. Jard. Malm. *pl.* 79. 1805.

*Zenobia speciosa pulverulenta* Ashe, Bot. Gaz. 24: 375. 1897.

A branching shrub 1–2 m. tall, with densely glaucous foliage; leaves very pale, the blades leathery, oblong to oval, varying to ovate or obovate, 2–7 cm. long, acute or cuspidate, or obtuse in age, entire or obscurely serrate or crenate, slightly reticulate above, short-petioled; flower-clusters in elongate racemes sometimes 5 dm. long; pedicels 1–2 cm. long; calyx 8–10 mm. wide, the lobes triangular, acute or short-acuminate, appressed; corolla white, campanulate, 6–7 mm. long, or larger; capsules ovoid-spheroidal, 6–7 mm. wide, glaucous.

TYPE LOCALITY: Florida.

DISTRIBUTION: North Carolina and South Carolina.

ILLUSTRATIONS: Bartr. Trav. *pl.* opp. 476; Vent. Jard. Malm. *pl.* 79; Bot. Mag. *pl.* 667; Wats. Dendr. 2: *pl.* 126.

26. *PIERIS* D. Don, Edinb. New Phil. Jour. 17: 159. 1834.

*Portuna* Nutt. Trans. Am. Phil. Soc. II. 8: 268. 1843.

Shrubs, with terete or nearly terete branches. Leaves alternate, persistent; blades broad or narrow, leathery, entire or nearly so, short-petioled. Flowers in raceme-like panicles which arise from the axils of the leaves near the ends of the branches, disposed thus in terminal panicles. Calyx persistent; lobes 5, mostly of a lanceolate type, appressed to the corolla, leathery. Corolla white or nearly so, pyramidal, usually narrow; tube prominently fluted or angled, the ridges protruding between the calyx-lobes and often saccate at the base; lobes very short, slightly spreading. Stamens 10, included; filaments slender, straight or nearly so, unappendaged; anthers short, oval or ovoid, each sac with a slender dorsal appendage. Ovary 5-celled, lobed, globular or depressed; style columnar; stigma minute. Capsule globular, the sutures not thickened.

Type species, *Andromeda formosa* Wall.



Calyx-lobes lanceolate or ovate-lanceolate, less than half as long as the capsule to which they are appressed; filaments puberulent; corolla less than 7 mm. long; capsule not angled.

1. *P. floribunda*.

Calyx-lobes linear-lanceolate, half as long as the capsule and spreading or recurved at maturity; filaments villous; corolla over 8 mm. long; capsule angled.

2. *P. cubensis*.

### 1. *Pieris floribunda* (Pursh) Benth. & Hook. Gen. Pl. 2: 588. 1876.

*Andromeda floribunda* Pursh; Sims, Bot. Mag. *pl.* 1566. 1813.

*Leucothoe floribunda* D. Don, Edinb. New Phil. Jour. 17: 159. 1834.

*Zenobia floribunda* DC. Prodr. 7: 598. 1839.

*Portuna floribunda* Nutt. Trans. Am. Phil. Soc. II. 8: 268. 1843.

*Andromeda montana* Buckl. Am. Jour. Sci. 45: 172. 1843.

A shrub 3–18 dm. tall, with strigose or somewhat bristly twigs and erect often gregarious stems and branches; leaf-blades leathery, oblong, elliptic, or oblong-lanceolate, 2–8 cm. long, acute or short-acuminate, serrulate, bristly ciliate, obtuse or subcordate at the base; petioles 3–10 mm. long, strigose; panicles rather dense, 5–10 cm. long; calyx glabrous, the lobes lanceolate or ovate-lanceolate, 2–2.5 mm. long, acute; corolla white, pyramidal-urceolate, 4.5–6 mm. long; anthers about 1 mm. long; capsules oblong-globose or ovoid-globose, 5–6 mm. long, somewhat angled.

TYPE LOCALITY: Mountains of Georgia.

DISTRIBUTION: Mountains, Virginia to Georgia.

ILLUSTRATIONS: Bot. Mag. *pl.* 1566; Bot. Reg. *pl.* 807; Paxton's Mag. Bot. 4: *pl.* 101; Britt. & Brown, Ill. Fl. f. 2768; ed. 2. f. 3242.

### 2. *Pieris cubensis* (Griseb.) Small.

*Andromeda cubensis* Griseb. Cat. Pl. Cub. 51. 1866.

A shrub mostly 2 m. tall or less, with glabrous or almost glabrous twigs and spreading branches; leaf-blades linear to linear-oblong or linear-lanceolate, 4–11 cm. long, acute or acutish, entire or obscurely and remotely toothed above the middle, callous-margined, glabrous, reticulate; petioles mostly less than 0.5 mm. long, glabrous; panicles open; calyx finely pubescent, the lobes linear-lanceolate, 5–6 mm. long, acuminate; corolla white, pyramidal-urceolate, 9–10 mm. long; anthers fully 1.5 mm. long; capsules globose or slightly depressed, 6–7 mm. long, slightly angled.

TYPE LOCALITY: Western Cuba.

DISTRIBUTION: Pinar del Rio, Cuba.

## 27. AMPELOTHAMNUS Small, Shrubs Fla. 96. 1913.

Shrubs, or usually vines, with nearly terete branches. (Stem flattened when under bark of tree.) Leaves alternate, persistent; blades rather broad, leathery, more or less toothed above the middle or near the apex, short-petioled. Flowers in raceme-like panicles which are solitary in the leaf-axils. Calyx persistent; lobes 5, of a lanceolate type, appressed to the corolla, leathery. Corolla white, ovoid; tube only slightly, if at all angled; lobes very short, broad, nearly erect. Stamens 10, included; filaments flat, broad, sigmoid-curved near the top, unappendaged; anthers oblong, each sac with a slender dorsal appendage. Ovary 5-celled, lobed, depressed; style slender-columnar; stigma minute. Capsule spheroidal, slightly lobed.

Type species, *Andromeda phillyreifolia* Hook.

### 1. *Ampelothamnus phillyreifolia* (Hook.) Small, Shrubs Fla. 96. 1913.

*Andromeda phillyreifolia* Hook. Ic. *pl.* 122. 1837.

*Pieris phillyreifolia* DC. Prodr. 7: 599. 1839.

?*Andromeda Croomia* Torr.; Wood, Class Book ed. 1861. 487. 1861.

A branching shrub 3–6 dm. tall with glabrate foliage, or a vine climbing the trunks of trees by creeping under outer bark; leaf-blades oblong to elliptic, oval, or oblong-oblong-lanceolate or rarely obovate, 2–7 cm. long, leathery, serrate near the apex, revolute, more or less shining above, narrowed into short petioles; racemes 1–4 cm. long, solitary in the leaf-axils, 4–12-flowered; flower-stalks 2–6 mm. long, with small subulate-lanceolate bracts; calyx-lobes

lanceolate or triangular-lanceolate, 4–5 mm. long, acute, lustrous; corolla ovoid, 7–8 mm. long, terete or nearly so; capsules spheroidal, 4–5 mm. broad, ribbed.—Usually climbs *Taxodium ascendens*, rarely on *Chamaecyparis* or *Cyrilla parvifolia*.

TYPE LOCALITY: Apalachicola, Florida.

DISTRIBUTION: Southern Georgia, northern Florida, and adjacent Alabama.

ILLUSTRATIONS: Hook. Ic. pl. 122; Bot. Reg. 30: pl. 36.

## 28. DESMOTHAMNUS Small, Shrubs Fla. 96. 1913.

Shrubs with prominently angled branches and glabrous foliage. Leaves alternate, persistent; blades leathery, broad, entire, with intramarginal veins, short-petioled. Flowers perfect, in the axils of the persistent leaves of the preceding year. Calyx somewhat succulent, stellate; lobes narrow, sometimes slightly foliaceous, persistent. Corolla white, pink, or red, of an ovoid-conic type and constricted at the orifice, nodding. Stamens 10, included; filaments slender above the slightly dilated base, glabrous, sometimes slightly papillose, each with a pair of appendages near the top; anthers short, unappendaged. Ovary 5-celled, ovoid, lobed; style fusiform; stigma minute. Capsule globose or ovoid-globose, rounded at the apex, the sutures thickened.

Type species, *Andromeda nitida* Bartr.

### 1. *Desmोधamnus lucidus* (Lam.) Small.

*Andromeda lucida* Lam. Encyc. 1: 157. 1783.

*Andromeda nitida* Bartr.; Marsh. Arbust 8. 1785.

*Andromeda coriacea* Ait. Hort. Kew. 2: 70. 1789.

*Andromeda myrtifolia* Salisb. Prodr. 290. 1796.

*Andromeda marginata* Veillard, Nouv. Duham. 1: 188. 1802.

*Lyonia marginata* D. Don, Edinb. New Phil. Jour. 17: 159. 1834.

*Leucothoe coriacea* DC. Prodr. 7: 602. 1839.

*Leucothoe marginata* Spach, Hist. Vég. 9: 482. 1840.

*Andromeda lacustris* C. Wright; Sauv. Anal. Acad. Ci. Habana 6: 250. 1870.

*Pieris nitida* Benth. & Hook. Gen. Pl. 2: 588. 1876.

*Andromeda obovata* Raf.; A. Gray, Syn. Fl. N. Am. 2<sup>1</sup>: 32, as synonym. 1878.

*Neopieris nitida* Britton; Britt. & Brown, Ill. Fl. ed. 2. 2: 690. 1913.

*Desmोधamnus nitidus* Small, Shrubs Fla. 96. 1913.

An evergreen shrub 1.5–2 m. tall, with sharply angled branches; leaf-blades leathery, oblong, elliptic, oval or obovate, or somewhat spatulate, 2–8 cm. long, abruptly acuminate, shining, at least above, smooth, revolute, narrowed into short petioles; flower-clusters axillary, often contiguous; pedicels 3–8 mm. long, clavate; calyx somewhat fleshy, the lobes lanceolate to linear-lanceolate, 3–5 mm. long in anthesis, acute or acuminate, lustrous; corolla white to red, ovoid-conic, 5–9 mm. long, somewhat constricted at the throat, the short lobes recurved; stamens 4–7 mm. long; capsules subglobose or ovoid-globose, about 4 mm. high, exceeded by the sepals or about equaling them in length.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Coastal plain, Virginia to Florida and Louisiana; Cuba.

ILLUSTRATIONS: Jacq. Ic. Pl. Rar. pl. 465 (as *Andromeda mariana*); Bot. Mag. pl. 1095; Britt. & Brown, Ill. Fl. f. 2769; ed. 2. f. 3243.

## 29. NEOPIERIS Britton; Britt. & Brown, Ill. Fl. ed. 2. 2: 690. 1913.

Shrubs with terete branches and sparingly pubescent or glabrate foliage. Leaves alternate, deciduous; blades thin-leathery, relatively broad, entire, without intramarginal veins, short-petioled. Flowers perfect, in clusters along the leafless branches of the previous year. Calyx herbaceous, stellate; lobes narrow, somewhat foliaceous, ribbed in age, deciduous with the leaves. Corolla white or pale, cylindraceous-campanulate, nodding. Stamens 10, included; filaments flat, pubescent, each with a pair of appendages near the top; anthers long, unappendaged. Ovary 5-celled, lobed, slightly elongate; style columnar; stigma slightly dilated. Capsule of an ovoid type, truncate at the contracted apex, the sutures much thickened.

Type species, *Andromeda mariana* L.



1. *Neopieris mariana* (L.) Britton; Britt. & Brown, Ill. Fl. ed. 2.  
2: 691. 1913.

*Andromeda mariana* L. Sp. Pl. 393. 1753.

*Andromeda pulchella* Salisb. Prodr. 289. 1796.

*Lyonia mariana* D. Don, Edinb. New Phil. Jour. 17: 159. 1834.

*Leucothoe mariana* DC. Prodr. 7: 602. 1839.

*Pieris mariana* Benth. & Hook. Gen. Pl. 2: 588. 1876.

A deciduous-leaved shrub 1–2 m. tall, with finely pubescent or glabrate foliage and erect or nearly erect branches; leaf-blades thin-leathery, firm, oblong to oval, sometimes broadest slightly above or below the middle, 2–6 cm. long, obtuse or apiculate, dull, somewhat reticulate, short-petioled; flower-clusters in elongate panicles; pedicels about 1 cm. long, or longer in fruit, clavate; calyx often puberulent, the lobes lanceolate, 7–9 mm. long, acute, firm in age and slightly accrescent; corolla white or pinkish, ovoid-cylindric, 9–11 mm. long, the lobes mostly spreading; stamens 9–10 mm. long; capsules ovoid-pyramidal, 7–9 mm. long, as long as the sepals or exceeded by them.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Rhode Island to Florida, Tennessee, and Arkansas.

ILLUSTRATIONS: Bot. Mag. pl. 1579; Britt. & Brown, Ill. Fl. f. 2770; ed. 2. f. 3244; Meehan, Nat. Fl. 2: pl. 47.

30. *XOLISMA* Raf. Am. Mo. Mag. 4: 193. 1819.

*Lyonia* Nutt. Gen. 1: 266. 1818. Not *Lyonia* Ell. 1817.

Shrubs, usually with much-branched stems, or small trees, the foliage lepidote. Leaves alternate, persistent; blades thick or leathery, usually broad, entire, undulate, or shallowly toothed, petioled. Flowers perfect, in cluster-like panicles in the axils of the leaves, the rachis sometimes slightly elongate. Calyx stellate; lobes 4–8, usually 5, mostly broad, rarely slightly elongate, much longer than the tube. Corolla white or pale, urceolate, exceeding the calyx, usually much longer, mostly nodding, the lobes much shorter than the tube. Stamens 8–16, included; filaments narrow or slender above the dilated base, usually puberulent or pubescent, unappendaged; anthers oblong or oval, the sacs unappendaged. Ovary 4–8-celled, depressed or slightly elongate; style columnar or fusiform; stigma minute. Capsule longer than thick or subglobose, angled, with the sutures much thickened, 4–8-valved, septicidal.

Type species, *Lyonia ferruginea* Nutt.

Corolla very short, globose, depressed.

Capsules ovoid, oblong-ovoid, or oval.

Leaves slightly reduced toward the ends of the branches; blades inconspicuously reticulate.

Leaves much reduced toward the ends of the branches; blades prominently reticulate.

Capsules subglobose.

Corolla long, ovoid, ovoid-urceolate, or cylindric.

Leaf-blades of a broadly ovate type, truncate to subcordate at the base.

Corolla 9–12 mm. long; leaf-blades truncate or subcordate at the base; anthers more than 2.5 mm. long.

Corolla 6–7 mm. long; leaf-blades rounded at the base; anthers less than 2.5 mm. long.

Leaf-blades not of an ovate type, narrowed or rounded at the base.

Leaf-blades entire or obscurely undulate.

Calyx-lobes of a lanceolate type, much longer than the tube in anthesis, acuminate.

Calyx-lobes of an ovate or deltoid type, not longer than the tube, obtuse or acute.

Capsules small, less than 5 mm. long.

Leaf-blades of an obovate, oval, or oblong type.

Leaf-blades not glaucous beneath.

Calyx 3–3.5 mm. wide; capsules oval or ovoid.

Calyx 2–2.5 mm. wide; capsules oblong, often narrowly so.

Leaf-blades glaucous beneath.

Calyx about 3 mm. wide, the lobes deltoid to ovate-deltoid; corolla about 4 mm. long.

Calyx about 4 mm. wide, the lobes suborbicular, varying to orbicular-ovate or orbicular-reniform; corolla 6–7.5 mm. long.

Leaf-blades of an elliptic type.

Capsules large, more than 5 mm. long.

Leaf-blades narrow, of an oblong or elliptic type.

Calyx-lobes usually 4; stamens usually 8.

1. *X. ferruginea*.

2. *X. fruticosa*.

3. *X. squamulosa*.

4. *X. heptamera*.

5. *X. dictyoneura*.

6. *X. calycosa*.

7. *X. myrtilloides*.

8. *X. myrsinefolia*.

9. *X. vaccinioides*.

10. *X. rubiginosa*.

11. *X. elliptica*.

12. *X. octandra*.

- Calyx-lobes usually 5; stamens usually 10.  
 Filaments scarcely dilated at the base; calyx-lobes ovate to reniform-ovate. 13. *X. fasciculata*.  
 Filaments much dilated at the base; calyx-lobes lanceolate to triangular. 14. *X. affinis*.  
 Leaf-blades broad, of a suborbicular, oval, or obovate type.  
 Leaf-blades small, prevailing less than 3 cm. long, smooth or obscurely reticulate or rugose. 15. *X. obtusa*.  
 Leaf-blades larger, prevailing more than 4 cm. long, decidedly reticulate or rugose.  
 Calyx-lobes orbicular-ovate to broadly ovate; corolla 4.5–5.5 mm. long. 16. *X. latifolia*.  
 Calyx-lobes deltoid to triangular-lanceolate; corolla 6–8 mm. long. 17. *X. macrophylla*.  
 Leaf-blades toothed.  
 Leaf-blades pale or glaucous beneath.  
 Pedicels and calyx with scant pale scurf; calyx about 4 mm. wide in anthesis. 18. *X. truncata*.  
 Pedicels and calyx with close brown scurf; calyx about 3 mm. wide in anthesis. 19. *X. tinensis*.  
 Leaf-blades neither pale nor glaucous beneath.  
 Corolla narrow, cylindric or ovoid-cylindric, not inflated.  
 Leaf-blades very thick, more or less reticulate.  
 Upper and lower surfaces of the leaf-blades nearly similar. 20. *X. Eggersii*.  
 Upper and lower surfaces of the leaf-blades very different.  
 Corolla about 5 mm. long; leaf-blades thickish, obscurely reticulate in age. 21. *X. Stahlia*.  
 Corolla 6–7 mm. long; leaf-blades very thick rather prominently reticulate. 22. *X. Tuerckheimii*.  
 Leaf-blades thinnish, with prominent lateral veins. 23. *X. costata*.  
 Corolla wide, ovoid-urceolate, inflated. 24. *X. Brittonii*.

1. *Xolisma ferruginea* (Walt.) A. Heller, Cat. N. Am. Pl. 6. 1898.

*Andromeda ferruginea* Walt. Fl. Car. 138. 1788.  
*Andromeda ferruginea arborescens* Michx. Fl. Bor. Am. 1: 252. 1803.  
*Andromeda rigida* Pursh, Fl. Am. Sept. 292. 1814.  
*Lyonia rigida* Nutt. Gen. 1: 266. 1818.  
*Lyonia ferruginea* G. Don, Gen. Hist. 3: 830. 1834. Not *L. ferruginea* Nutt. 1818.  
*Lyonia rhomboidalis* G. Don, Gen. Hist. 3: 831. 1834.

A widely branching shrub or a small tree, with reddish-scurfy twigs; leaves not much reduced toward the ends of the branchlets, the blades elliptic, oval, obovate, or oblanceolate, 2.5–7 cm. long, acute, short-acuminate, or mucronate, glabrous above, red-scurfy beneath, short-petioled; panicles short, often cluster-like, more or less leafy-bracted; calyx 3.5–4 mm. wide, the lobes deltoid-ovate, abruptly pointed; corolla 2.5–3 mm. long; filaments puberulent; anthers nearly 1.5 mm. long; capsules oblong-ovoid to oval, 4–6 mm. long.

TYPE LOCALITY: Carolina.  
 DISTRIBUTION: South Carolina to Florida.  
 ILLUSTRATION: Vent. Jard. Malm. pl. 80.

2. *Xolisma fruticosa* (Michx.) Nash, Bull. Torrey Club 22: 153. 1895.

*Andromeda ferruginea fruticosa* Michx. Fl. Bor. Am. 1: 252. 1803.  
*Andromeda ferruginea* Pursh, Fl. Am. Sept. 292. 1814. Not *A. ferruginea* Walt. 1788.  
*Lyonia ferruginea* Nutt. Gen. 1: 266. 1818.

An erect shrub 2 m. tall or less, with pale-scurfy twigs; leaves much reduced in size at the ends of the branchlets, the blades oval or obovate to oblanceolate, mostly 1–5 cm. long, acute or abruptly acuminate at both ends, or sometimes obtuse, prominently reticulate, bright-green or shining above, pale or glaucous beneath, short-petioled; panicles cluster-like, often approximate on the elongate branchlets; calyx mostly 3–4 mm. wide, sometimes wider in age, the lobes deltoid-ovate or nearly reniform, often wider than long; corolla 3–4 mm. long; filaments pubescent; anthers fully 1 mm. long; capsules ovoid, 4–6 mm. long.

TYPE LOCALITY: Florida.  
 DISTRIBUTION: South Carolina to Florida.  
 ILLUSTRATION: Bot. Cab. pl. 430 (as *Andromeda rigida*).

3. *Xolisma squamulosa* (Mart. & Gal.) Small.

*Lyonia squamulosa* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 542. 1842.

A widely branching shrub mostly less than 2 m. tall, with red-scurfy twigs; leaf-blades oval or elliptic, varying to broadest above or below the middle, or sometimes slightly rhombic,



1–3 cm. long, obtuse or acutish, smooth and shining above, dull beneath, or more or less reticulate on both sides, somewhat scurfy beneath, short-petioled; panicles cluster-like, often approximate; calyx about 5 mm. wide, the lobes deltoid or ovate-deltoid, acute; corolla 3–4 mm. long; filaments puberulent; anthers fully 1 mm. long; capsules subglobose or depressed, 3.5–4 mm. long.

TYPE LOCALITY: Cofre de Perote, Vera Cruz.

DISTRIBUTION: Mexico.

#### 4. *Xolisma heptamera* (Urban) Small.

*Lyonia heptamera* Urban, Symb. Ant. 1: 376. 1899.

A much-branched shrub 2 m. tall or less, with brown-scurfy stout twigs; leaves not crowded, the blades very thick-leathery, broadly ovate, 3.5–6 cm. long, obtuse or rounded at the apex, shining above, coarsely reticulate and more or less brown-scurfy beneath, with the stout midrib and lateral veins prominent, stout-petioled; racemes 3–10 cm. long, the peduncle and pedicels red-tomentulose; calyx-lobes 6 or 7, deltoid or ovate-deltoid, 3–3.5 mm. long, acute; corolla pale, densely scurfy, conic, 9–12 mm. long, the lobes ovate, much shorter than the tube; filaments about 8 mm. long, dilated at the base; anthers oblong, about 3 mm. long; capsules spheroidal, 5–6 mm. wide.

TYPE LOCALITY: Pico del Valle, Santo Domingo.

DISTRIBUTION: Santo Domingo.

#### 5. *Xolisma dictyoneura* (Urban) Small.

*Lyonia dictyoneura* Urban, Symb. Ant. 7: 533. 1913.

A much-branched shrub with brown- or pale-scurfy stoutish twigs; leaves bright-green or yellowish-green, the blades 3–5 cm. long, acute or obtuse at the apex, shining above, prominently reticulate and somewhat scurfy beneath, with the midrib and lateral veins very prominent, stout-petioled; racemes 1–2.5 cm. long, the peduncle and pedicels red-pubescent; calyx-lobes 5 or 6, broadly ovate to deltoid-ovate, 2.5–3 mm. long, acute or abruptly short-acuminate; corolla white, scurfy, broadly urceolate, 6–7 mm. long, the lobes triangular-lanceolate, much shorter than the tube; filaments about 4.5 mm. long; anthers about 2.3 mm. long; capsules not seen.

TYPE LOCALITY: Culo de Maco, Azua, Santo Domingo.

DISTRIBUTION: Known only from the type locality.

#### 6. *Xolisma calycosa* Small, sp. nov.

A small tree, often 3–4 m. tall, with densely brown-scurfy twigs; leaves not crowded, the blades leathery, oval or broadly elliptic, varying to slightly broadest above the middle or below it, obtuse or rounded at the apex, ultimately glabrous, slightly shining above, pale and slightly reticulate beneath, with the midrib prominent and the lateral veins not very prominent, rather long-petioled; racemes cluster-like, 1–2.5 cm. long, the pedicels densely brown-scurfy; calyx-lobes 5, lanceolate, 4–5 mm. long, acuminate; corolla white, somewhat scurfy, ovoid-conic, 6–7 mm. long, the lobes triangular-ovate, much shorter than the tube; filaments 4–5 mm. long, abruptly dilated at the base; anthers oblong, nearly 2 mm. long; capsules ovoid, 6–7 mm. long.

Type collected between Firmeza and Gran Piedra, Cuba, March 4, 5, 1911, *Shafer 8997* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Known only from the type locality.

#### 7. *Xolisma myrtilloides* (Griseb.) Small.

*Lyonia myrtilloides* Griseb. Cat. Pl. Cub. 50. 1866.

*Lyonia myrtilloides parvifolia* Griseb. Cat. Pl. Cub. 51. 1866.

*Lyonia myrtilloides ovalifolia* Griseb. Cat. Pl. Cub. 51. 1866.

A much-branched shrub mostly less than 4 m. tall, with pale- or reddish-scurfy twigs; leaves numerous, sometimes rather crowded, light-green, the blades very thick, oval, obovate, or cuneate, mostly 1–2.5 cm. long, obtuse or rounded at the apex, ultimately glabrous or nearly so, mostly dull and smooth above, slightly veiny beneath, short-petioled; panicles cluster-like, the pedicels ultimately nearly glabrous; calyx 3–3.5 mm. wide, the lobes 5, deltoid, acute or acutish; corolla white or nearly so, scurfy, ovoid, about 4 mm. long, the lobes very broad,

much shorter than the tube; filaments nearly glabrous, 2–2.5 mm. long; anthers oblong, about 1 mm. long; capsules oval or ovoid, 3–4 mm. long.

TYPE LOCALITY: Cuba.  
DISTRIBUTION: Cuba.

### 8. *Xolisma myrsinefolia* (A. Rich.) Small.

*Leucothoe myrsinefolia* A. Rich. in Sagra, Hist. Cuba 11: 74. 1850.

A much-branched shrub less than 3 m. tall with dark-scurfy twigs; leaves often numerous, deep-green, the blades thick and firm, oval, varying to broadly obovate, 1–3 cm. long, obtuse, rounded, or notched at the apex, dull and scabro-reticulate above, somewhat veiny beneath, undulate, nearly glabrous in age, short-petioled; panicles cluster-like, the pedicels short, permanently scurfy; calyx 2–2.5 mm. wide, the lobes 4 or 5, deltoid to ovate-deltoid, acute or abruptly pointed; capsules oblong, often narrowly so, 3–4 mm. long.

TYPE LOCALITY: Near Santiago, Cuba.  
DISTRIBUTION: Eastern Cuba

### 9. *Xolisma vaccinioides* Small, sp. nov.

A shrub with reddish- or pale-scurfy twigs; leaves numerous, bright-green, the blades thickish, oblong or oval, varying to broadest above or below the middle, 1–3 cm. long, obtuse or truncate at the apex, undulate, reticulate, shining above, dull beneath, short-petioled; panicles cluster-like, rather many-flowered, the pedicels slender; calyx about 3 mm. wide, the lobes 4 or 5, deltoid to ovate-deltoid, abruptly pointed; corolla white (?), urceolate, about 4 mm. long, the lobes 4 or 5, very broad, much shorter than the tube; filaments about 2 mm. long, slender above the dilated bases, minutely puberulent; anthers 1 mm. long; capsules narrowly ovoid, 3.5–4.5 mm. long.

Type collected at Nueva Gerona, Isle of Pines, Cuba, Curtiss, March, 1904 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Known only from the type locality.

### 10. *Xolisma rubiginosa* (Pers.) Small.

*Andromeda rubiginosa* Pers. Syn. Pl. 1: 481. 1805.  
*Andromeda pubescens* Poir. in Lam. Encyc. Suppl. 1: 355. 1810.  
*Lyonia rubiginosa* G. Don, Gen. Hist. 3: 841. 1834.

A widely branching shrub or small tree, with pale-scurfy twigs; leaves not crowded, bright-green, the blades thickish, oval, elliptic, or obovate, mostly 2–4 cm. long, obtuse or rounded at the apex, somewhat reticulate but shining above, dull, glaucous, and not reticulate beneath, undulate or obscurely crenate, nearly glabrous in age, short-petioled; panicles cluster-like, few-flowered, the pedicels short, densely scurfy; calyx about 4 mm. wide, the lobes 5–7, suborbicular, varying to orbicular-ovate or orbicular-reniform, abruptly pointed; corolla conic, 6–7.5 mm. long, the lobes acute, much shorter than the tube; filaments very slender, nearly glabrous, 3–3.5 mm. long; anthers about 1.5 mm. long; capsules ovoid, about 5 mm. long.

TYPE LOCALITY: St. Thomas.  
DISTRIBUTION: Hispaniola and St. Thomas.

### 11. *Xolisma elliptica* (C. Wright) Small, sp. nov.

*Lyonia elliptica* C. Wright; Griseb. Cat. Pl. Cub. 51, as synonym. 1866.

A much-branched shrub mostly less than 2 m. tall, with reddish-scurfy twigs; leaves numerous, bright-green, the blades thickish, elliptic or oval, varying to broadest above or below the middle, mostly 2–5 cm. long, obtuse or acutish, finely reticulate on both sides, somewhat shining above, dull and paler or glaucous beneath, undulate or obscurely toothed, glabrous or nearly so in age, short-petioled; panicles cluster-like, few-flowered, the pedicels short, ultimately glabrous; calyx about 3 mm. broad, the lobes 5, deltoid, acute; corolla not seen; capsules oblong, about 3 mm. long.

Type collected in Cuba, C. Wright 2197 (herb. Columbia Univ.).  
DISTRIBUTION: Eastern Cuba.



12. *Xolisma octandra* (Sw.) Small.*Andromeda octandra* Sw. Prodr. 73. 1788.*Lyonia octandra* Griseb. Fl. Brit. W. Ind. 142. 1859.

A much-branched shrub or small tree, with sparingly scurfy twigs; leaves numerous, bright-green, the blades thickish, oblong to oblong-elliptic, or slightly broadest above the middle, mostly 3–6 cm. long, obtuse, entire, sometimes undulate, nearly smooth and shining above, slightly paler and sometimes obscurely reticulate beneath, short-petioled; panicles cluster-like, several-flowered, the pedicels short; calyx about 4 mm. wide, the lobes usually 4, deltoid to ovate-deltoid, abruptly pointed; corolla not seen; capsules ovoid or oval, 3.5–4 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

13. *Xolisma fasciculata* (Sw.) Small.*Andromeda fasciculata* Sw. Prodr. 73. 1788.*Andromeda jamaicensis* Sw. Prodr. 73. 1788.*Lyonia fasciculata* G. Don, Gen. Hist. 3: 831. 1834.*Lyonia jamaicensis* D. Don, Edinb. New Phil. Jour. 17: 159. 1834.

A branching shrub mostly 3 m. tall or less, with pale- or reddish-scurfy twigs; leaves numerous, bright-green, the blades thick, elliptic, sometimes narrowly so, to oblong, varying to broadest above or below the middle, mostly 2–7 cm. long, obtuse, reticulate on both sides, shining above, dull and slightly paler beneath, entire, short-petioled; panicles short; calyx 4–5 mm. wide, the lobes usually 5, reniform-ovate to ovate, acute; corolla white or nearly so, conic-urceolate, 6.5–7.5 mm. long, the lobes broad, much shorter than the tube; filaments 4–5 mm. long, very slender above the dilated bases, nearly glabrous; anthers about 1 mm. long; capsules ovoid, 5–6 mm. long, the ribs very prominent.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

ILLUSTRATION: Bot. Mag. *pl.* 4273.14. *Xolisma affinis* (A. Rich.) Small.*Leucothoe affinis* A. Rich. in Sagra, Hist. Cuba 11: 74. 1850.

A much-branched shrub mostly 2 m. tall or less, with pale scurfy-canescient twigs; leaves rather numerous, pale-green, the blades elliptic to oblong, varying to broadest above or below the middle, 3–9 cm. long, obtuse or acutish, slightly reticulate, shining above, dull and pale, sometimes glaucescent beneath, entire, short-petioled; panicles short; calyx 5–5.5 mm. wide, the lobes 5, lanceolate to triangular, acute or slightly acuminate; corolla 7–8 mm. long, the lobes broad, much shorter than the tube; filaments 4–5 mm. long, very slender above the much dilated bases, glabrous or very sparingly villous; anthers 1.5 mm. long; capsules ovoid, 4.5–5.5 mm. long, the ribs prominent.

TYPE LOCALITY: Santiago, Cuba.

DISTRIBUTION: Eastern Cuba.

15. *Xolisma obtusa* (Griseb.) Small.*Lyonia obtusa* Griseb. Cat. Pl. Cub. 51. 1866.*Andromeda obtusa* C. Wright; Sauv. Anal. Acad. Ci. Habana 6: 250. 1870.

A rigidly branched shrub mostly less than 2 m. tall, with red-scurfy twigs; leaves numerous, bright-green, the blades oblong, oval, or suborbicular, varying to broadest above or below the middle, 1.5–4 cm. long, rounded or emarginate at the apex, smooth and shining above, or slightly reticulate in age, dull and pale beneath, entire, more or less revolute, short-petioled; panicles cluster-like, few-flowered, the pedicels stout; calyx 7–9 mm. wide, the lobes 5, deltoid to triangular-lanceolate, acute or acuminate; corolla not seen; capsules oval to ovoid, 6–8 mm. long.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Eastern Cuba.

16. *Xolisma latifolia* (A. Rich.) Small.

*Leucothoe latifolia* A. Rich. in Sagra, Hist. Cuba 11: 74. 1850.

*Lyonia latifolia* Griseb. Cat. Pl. Cub. 51, in part. 1866.

*Andromeda latifolia* C. Wright; Sauv. Anal. Acad. Ci. Habana 6: 250. 1870.

A rigidly branched shrub mostly 2 m. tall or less, with red-scurfy twigs; leaves not crowded, deep-green, the blades broadly oval or suborbicular, or sometimes obovate, mostly 4–8 mm. long, rounded or retuse at the apex, smooth and shining above, or coarsely reticulate in age, dull and reticulate beneath, entire, revolute, short-petioled; calyx 5–6 mm. wide, the lobes orbicular-ovate to broadly ovate, acute or acutish; corolla ovoid-urceolate, pinkish, 4.5–5.5 mm. long, the lobes very short; filaments about 3 mm. long, slender above the much dilated bases, puberulent; anthers 1.5 mm. long; capsules ovoid, 5–6 mm. long.

TYPE LOCALITY: Near Santiago, Cuba.

DISTRIBUTION: Eastern Cuba.

ILLUSTRATION: Sagra, Hist. Cub. 11: *pl.* 52.

17. *Xolisma macrophylla* Britton, sp. nov.

A rigidly branched shrub or small tree, with reddish- or pale-scurfy twigs; leaves numerous, bright-green, the blades oblong or oval, varying to broadest above or below the middle, mostly 3–6 cm. long, rounded at the apex, reticulate on both sides, shining above, dull and paler beneath, entire, short-petioled; panicles cluster-like, few-flowered, the pedicels rather short and stout; calyx 5.5–6.5 mm. wide, the lobes deltoid to triangular-lanceolate, acute; corolla white, 6–8 mm. long, conic-urceolate, the lobes very short; filaments 4–4.5 mm. long, very slender above the slightly dilated bases, minutely pubescent; anthers 1.5 mm. long; capsules ovoid, 5.5–6.5 mm. long.

Type collected in the pinelands southeast of Paso Estancia, Oriente, Cuba, *Shafer 1680* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Oriente, Cuba.

18. *Xolisma truncata* (Urban) Small.

*Lyonia truncata* Urban, Symb. Ant. 7: 318. 1912.

A much-branched shrub or small tree, with brownish-scurfy twigs; leaves numerous, bright-green, the blades oval or elliptic, suborbicular, or obovate, 1–4.5 cm. long, mostly truncate at the apex, irregularly crenate or crenulate, sometimes slightly reticulate at maturity, shining above, dull beneath, short-petioled; panicles cluster-like, few-flowered, the pedicels short; calyx 3.5–4 mm. wide, the lobes 5, deltoid-ovate, abruptly pointed; corolla 5–6 mm. long, ovoid-urceolate, the lobes broad, much shorter than the tube; filaments 3.5–4 mm. long, slender above the slightly dilated bases, granular-puberulent; anthers less than 1.5 mm. long; capsules broadly ovoid or oval, 4–5 mm. long.

TYPE LOCALITY: Barahona, Santo Domingo.

DISTRIBUTION: Hispaniola.

19. *Xolisma tinensis* (Urban) Small.

*Lyonia tinensis* Urban, Symb. Ant. 7: 533. 1913.

A much-branched shrub with dark-brown scurfy twigs; leaves numerous, bright-green, except the brown scurf on the younger ones, the blades elliptic-ovate, oblong-ovate, or oblong, 2–3.5 cm. long, obtuse or truncate at the apex, thick-leathery, crenate, somewhat revolute, rather coarsely but not very prominently reticulate beneath, nearly smooth and dull or slightly shining above, short-petioled; panicles cluster-like, few-flowered, the pedicels short; calyx about 3 mm. wide, the lobes 4 or 5, deltoid-ovate, reniform-ovate, or somewhat pentagonal, acute or abruptly pointed; corolla 5–6 mm. long, cylindric-urceolate, the lobes triangular, much shorter than the tube; filaments about 3 mm. long, slender above the slightly dilated bases, glabrous or nearly so; anthers scarcely 1 mm. long; capsules not seen.

TYPE LOCALITY: Placer de la Tina, Azua, Santo Domingo.

DISTRIBUTION: Known only from the type locality.



20. *Xolisma Eggersii* (Urban) Small.

*Lyonia Eggersii* Urban, Symb. Ant. 7: 534. 1913.

A much-branched shrub 1–2 m. tall, with red-scurfy twigs; leaves bright-green, the blades oblong or oval, or individually ovate, 2–5 cm. long, obtuse or truncate at the apex, crenulate, smooth on both sides, shining above, ultimately glabrous, rounded or truncate at the base, short-petioled; flowers and fruits not seen.

TYPE LOCALITY: Near Constanza, Santo Domingo.

DISTRIBUTION: Known only from the type locality.

21. *Xolisma Stahlia* (Urban) Small.

*Lyonia Stahlia* Urban, Symb. Ant. 5: 453. 1908.

A shrub (?) or small tree (?), with scurfy twigs; leaves numerous, bright-green, the blades oval or elliptic, varying to obovate, 3–6 cm. long, obtuse or rounded at the apex, crenulate, obscurely reticulate in age, somewhat shining above, dull beneath, short-petioled; panicles raceme-like or cluster-like, few-flowered, the pedicels rather slender; calyx 3.5–4 mm. wide, the lobes 5, deltoid to ovate-deltoid, acute or abruptly pointed; corolla conic-urceolate, about 5 mm. long, the lobes broad, much shorter than the tube; filaments 2–3 mm. long, very slender above the abruptly dilated bases, nearly glabrous; anthers about 1 mm. long; capsules narrowly ovoid, 5–6 mm. long.

TYPE LOCALITY: Near Bayamon, Porto Rico.

DISTRIBUTION: Porto Rico.

22. *Xolisma Tuerckheimii* (Urban) Small.

*Lyonia Tuerckheimii* Urban, Symb. Ant. 7: 317. 1912.

A much-branched shrub 1.5 m. tall or less, with brownish-scurfy twigs; leaves numerous, bright-green, the blades thick, oblong, elliptic, or oval, 2–5 cm. long, acute, acutish, or obtuse at the apex, crenulate, callous-margined, rather prominently reticulate in age, slightly shining above, dull beneath, short-petioled; panicles cluster-like, rather many-flowered, the pedicels rather slender; calyx 4–5 mm. wide, the lobes 5, ovate to deltoid, acute or abruptly pointed; corolla white or pinkish, cylindric-urceolate, 6–7 mm. long, the lobes 5, broad, much shorter than the tube; filaments 3–4 mm. long, very slender above the slightly dilated bases, nearly glabrous; anthers fully 1 mm. long; capsules oblong-ovoid, 4–6 mm. long.

TYPE LOCALITY: Near Constanza, Santo Domingo.

DISTRIBUTION: Known only from the type locality.

23. *Xolisma costata* (Urban) Small.

*Lyonia costata* Urban, Symb. Ant. 7: 316. 1912.

A tree with brownish-scurfy twigs; leaves numerous, bright-green, the blades thickish, elliptic or oblong-elliptic, or rarely obovate, 3–6.5 cm. long, obtuse or rarely acute, crenulate, finely reticulate, often slightly shining above, dull beneath, short-petioled; panicles cluster-like, rather many-flowered, the pedicels slender; calyx 4.5–5 mm. long, the lobes 5, ovate, sometimes broadly so, abruptly pointed; corolla white, cylindric-urceolate, 8–9 mm. long, the lobes broad, very much shorter than the tube; filaments 4.5–5.5 mm. long, very slender above the short dilated bases; anthers fully 1 mm. long; capsules not seen.

TYPE LOCALITY: Between Constanza and Valle, Santo Domingo.

DISTRIBUTION: Santo Domingo.

24. *Xolisma Brittonii* Small, sp. nov.

A much-branched shrub mostly 2 m. tall or less, with brownish scurfy twigs; leaves numerous, bright-green, the blades oblong, oval, or obovate or some of them oblong-spatulate, 3–6.5 cm. long, rounded or truncate at the apex, irregularly crenulate, finely reticulate, dull on both sides or sometimes shining above, short-petioled; panicles cluster-like, rather few-flowered, the pedicels stoutish; calyx 4.5–5.5 mm. wide, the lobes 5, deltoid to triangular-ovate, acute or abruptly pointed; corolla white, broadly urceolate, 7–8 mm. long, the lobes broad, much

shorter than the tube; filaments 4–5 mm. long, very slender above the dilated bases, minutely pubescent; anthers fully 1 mm. long; capsules ovoid, 6–6.5 mm. long, the ribs very broad.

Type collected in the vicinity of El Cuero, Oriente, Cuba, *Britton & Cowell 12773* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Known only from the type locality.

#### DOUBTFUL SPECIES

LEUCOTHOE GLANDULOSA A. Rich. in Sagra, Hist. Cuba 11: 74. 1850. (*Lyonia glandulosa* Griseb. Cat. Pl. Cub. 51. 1866. *Andromeda glandulosa* C. Wright; Sauv. Anal. Acad. Ci. Habana 6: 249. 1870.)

### 31. ARSENOCOCCUS Small; Small & Carter, Fl. Lancaster Co. 218. 1913.

Shrubs with erect branching stems and more or less pubescent foliage. Leaves alternate, deciduous; blades membranous, sometimes thickish, relatively broad, shallowly toothed, sessile or short-petioled. Flowers perfect, the clusters or racemes in terminal naked or leafy-bracted panicles. Calyx rotate, persistent; lobes usually 5, short, broad, much longer than the tube. Corolla white or nearly so, urceolate, usually globular or depressed, much exceeding the calyx; lobes very short, spreading or recurved. Stamens mostly 10, included; filaments slender above the dilated base, flattened, pubescent, unappendaged; anthers short, much shorter than the filaments, unappendaged. Ovary mostly 5-celled, depressed; style short, straight; stigma minute. Ovules numerous. Capsule depressed, usually spheroidal, ribbed at the sutures, but not angled, much longer than the calyx.

Type species, *Vaccinium ligustrinum* L.

Racemes and panicles naked or nearly so, disposed in short stout compound panicles.

1. *A. ligustrinus*.

Racemes and panicles leafy-bracted, disposed in elongate slender compound panicles.

2. *A. frondosus*.

#### 1. *Arsenococcus ligustrinus* (L.) Small; Small & Carter, Fl. Lancaster Co. 218. 1913.

*Vaccinium ligustrinum* L. Sp. Pl. 351. 1753.  
*Andromeda racemosa* Lam. Encyc. 1: 158. 1783.  
*Andromeda paniculata* Ait. Hort. Kew. 2: 68. 1799.  
*Andromeda paniculata nudiflora* Michx. Fl. Bor. Am. 1: 254. 1803.  
*Lyonia paniculata* Nutt. Gen. 1: 266. 1818.  
*Lyonia salicifolia* Wats. Dendr. pl. 38. 1825.  
*Lyonia capreaefolia* Wats. Dendr. pl. 127. 1825.  
*Lyonia multiflora* Wats. Dendr. pl. 128. 1825.  
*Lyonia ligustrina* DC. Prodr. 7: 599. 1839.  
*Lyonia ligustrina capreaefolia* DC. Prodr. 7: 600. 1839.  
*Lyonia ligustrina salicifolia* DC. Prodr. 7: 600. 1839.  
*Lyonia parabolica* K. Koch, Dendr. 2<sup>1</sup>: 119. 1872.  
*Xolisma ligustrina* Britton, Mem. Torrey Club 4: 135. 1894.

A branching shrub 1–4 m. tall, with more or less pubescent foliage; leaf-blades oblong, elliptic, or obovate, 3–7 cm. long, usually acute or abruptly acuminate, nearly entire or serrulate, narrowed into short petioles; panicles elongate or cluster-like, naked; pedicels 1–6 mm. long; calyx 3.5–4 mm. broad, the lobes triangular-ovate, acute or acutish, spreading; corolla white, subglobose or ovoid-globose, 2.5–3.5 mm. in diameter; capsules spheroidal, 3 mm. in diameter.

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Maine to Arkansas and Florida.

ILLUSTRATIONS: Wats. Dendr. pl. 37, 38, 127, 128; Britt. & Brown, Ill. Fl. f. 2771; ed. 2. f. 3245.

#### 2. *Arsenococcus frondosus* (Pursh) Small, Shrubs Fla. 97. 1913.

*Andromeda paniculata foliosiflora* Michx. Fl. Bor. Am. 1: 255. 1803.  
*Andromeda frondosa* Pursh, Fl. Am. Sept. 295. 1814.  
*Lyonia frondosa* Nutt. Gen. 1: 267. 1818.  
*Andromeda ligustrina pubescens* A. Gray, Syn. Fl. N. A. 2<sup>1</sup>: 33. 1878.  
*Xolisma ligustrina foliosiflora* C. Mohr, Bull. Torrey Club 24: 24. 1897.  
*Xolisma foliosiflora* Small, Fl. SE. U. S. 889. 1903.  
*Andromeda ligustrina foliosiflora* Fernald, in Rob. & Fern. Man. 635. 1908.



A widely branching shrub 1–4 m. tall, with nearly glabrous or sparingly pubescent foliage; leaf-blades leathery, oblong to narrowly elliptic or sometimes oval or obovate, 2–8 cm. long, acute or acuminate at both ends, distinctly serrulate, usually shining above, short-petioled; panicles copiously leafy-bracted; pedicels 3–8 mm. long; calyx flattish, 3–4 mm. broad, the lobes ovate or half-orbicular; corolla white or pinkish, subglobose, 2–3 mm. in diameter; capsules subglobose or spheroidal, 3–3.5 mm. long, 5–6-ribbed.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Coastal plain, Virginia to Florida and Louisiana.

### 32. EPIGAEA L. Sp. Pl. 395. 1753.

Low or depressed evergreen shrubby plants, with creeping stems and branches. Leaves alternate; blades leathery, entire, firm in age, petioled. Flowers perfect or dioecious, often heteromorphous, in axillary clusters. Calyx subtended by several bractlets; lobes 5, imbricate, persistent. Corolla white or pink, salverform; limb usually with 5 lobes. Stamens 10, included; filaments adnate to the base of the corolla-tube; anthers elongate, awnless. Disk 10-lobed. Ovary 5-celled, 5-lobed, pubescent; style elongate, straight; stigma 5-lobed, the lobes sometimes slightly elongate. Ovules numerous in each cavity. Capsule depressed-globose, loculicidally 5-valved, hirsute.

Type species, *Epigaea repens* L.

#### 1. *Epigaea repens* L. Sp. Pl. 395. 1753.

Plants bright-green or sometimes purple-tinged, hirsute, the stems branched at the base, the branches creeping, 0.5–3 dm. long; leaves persistent, the blades leathery, oblong, ovate, oblong-ovate, or suborbicular, 2–10 cm. long, apiculate or acute, reticulate, ciliate, rounded or cordate at the base; petioles 6–50 mm. long; clusters few-many-flowered; bracts ovate to lanceolate, acute; calyx glabrous or nearly so, the lobes lanceolate to ovate, acuminate, 5–9 mm. long; corolla pink or white, the tube cylindric, nearly twice as long as the sepals, the lobes spreading, ovate, obtuse, or abruptly-pointed, about half as long as the tube, pubescent within; capsules spheroidal, pubescent, 7–9 mm. broad.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Newfoundland to Saskatchewan, and southward to Florida, Kentucky, and Michigan.

ILLUSTRATIONS: Lam. Tab. Encyc. *pl.* 367; Andr. Bot. Rep. 2: *pl.* 102; Bot. Cab. *pl.* 160; Bot. Reg. 3: *pl.* 201; Goodale, Wild Fl. Am. *pl.* 37; Meehan's Mo. 3: *pl.* 2; Garden 45: 193; Britt. & Brown, Ill. Fl. f. 2774; ed. 2. f. 3247; Hervey, Wild Fl. Am. *pl.* 12; Mathews, Field Book 331.

### 33. GAULTHERIA L. Sp. Pl. 395. 1753.

Evergreen shrubs, various in habit, with horizontal (rootstocks) or erect stems. Leaves usually alternate; blades leathery, mostly broad, toothed, sometimes obscurely so. Flowers solitary in the axils, or in racemes or panicles. Calyx persistent; lobes longer than the tube and hypanthium, often accrescent. Corolla campanulate, conic, ovoid or urceolate with 5 spreading or recurved lobes. Stamens 10, included; filaments adnate to the base of the corolla-tube; anthers usually 2-awned, opening by terminal pores. Disk 10-lobed. Ovary 5-celled, 5-lobed, glabrous; style columnar; stigma entire. Ovules numerous in each cavity. Fruit berry-like, fleshy, the capsule inclosed in the accrescent hypanthium and calyx, which is often highly colored and aromatic.

Type species, *Gaultheria procumbens* L.

Corolla campanulate, prominently 5-lobed.

Corolla slightly exceeding the calyx; calyx glabrous; leaf-blades of an oval or suborbicular type.

Corolla much exceeding the calyx; calyx pubescent; leaf-blades of an ovate type.

Corolla urceolate, ovoid, or conic, slightly 5-lobed.

Flowers arising singly from the leaf-axils; flower-stalks with scales just under the calyx.

Flowers in scaly-bracted raceme-like panicles which arise from scaly buds; flower-stalks with scales remote from the calyx.

Corolla slightly exceeding the calyx; panicles few-flowered, mostly

1. *G. humifusa*.

2. *G. ovatifolia*.

3. *G. procumbens*.

- shorter than the leaves; West Indian plants.  
 Corolla glabrous; leaf-blades manifestly toothed.  
 Corolla pubescent; leaf-blades obscurely toothed.  
 Corolla much exceeding the calyx; panicles several-many-flowered,  
 mostly longer than the leaves; continental plants.  
 Leaf-blades narrow, of a narrowly lanceolate or linear-elliptic  
 type.  
 Leaf-blades broader, of an oblong, ovate, oval, suborbicular or  
 somewhat reniform type.  
 Calyx less than one half as long as the corolla, the lobes mostly  
 wider than long.  
 Calyx one half as long as the corolla or more, the lobes deltoid  
 or longer than wide.  
 Panicle-branches twice as long as the corollas or more.  
 Panicle-branches about as long as the corollas or slightly  
 longer.  
 Corolla glabrous.  
 Filaments pubescent; leaf-blades rounded or sub-  
 cordate at the base.  
 Panicle-rachis and branches pubescent.  
 Panicle-rachis and branches glabrous.  
 Leaf-blades of an ovate type, glaucous;  
 panicles short, few-flowered.  
 Leaf-blades of an oblong type, green; panicles  
 elongate, many-flowered.  
 Filaments glabrous; leaf-blades acuminate at both  
 ends.  
 Corolla pubescent, with short stiff hairs, or hirsute or  
 glandular-hirsute.  
 Corolla relatively small, less than 8 mm. long;  
 plants of Mexico and Central America.  
 Filaments longer than the anthers.  
 Corolla pubescent with mostly short stiff or  
 crisped glandless hairs.  
 Twigs or branchlets strigose, hirsute or  
 hirsutulous, the hairs glandless.  
 Twigs strigose; calyx-lobes lanceolate  
 to triangular-lanceolate.  
 Twigs hirsute or hirsutulous; calyx-  
 lobes deltoid to ovate-deltoid.  
 Twigs shaggy-hirsute; bracts con-  
 spicuous; stamens less than 4 mm.  
 long, the filaments sparingly  
 short-hairy.  
 Twigs hirsutulous; bracts incon-  
 spicuous; stamens over 4 mm.  
 long, the filaments copiously  
 long-hairy.  
 Twigs or branchlets glandular-pubescent.  
 Corolla pubescent with stiff, often long,  
 gland-tipped hairs.  
 Calyx pubescent with short, fine, mostly  
 glandless hairs.  
 Calyx pubescent with coarse, long, mostly  
 gland-tipped hairs.  
 Leaf-blades deltoid-ovate or cordate-  
 ovate.  
 Leaf-blades ovate to oblong, or indi-  
 vidually oval or suborbicular or  
 rarely broader.  
 Leaf-blades cordate at the base.  
 Leaf-blades abruptly narrowed,  
 rounded, or truncate at the  
 base.  
 Calyx-lobes lanceolate, triangu-  
 lar-lanceolate or ovate-lance-  
 olate.  
 Calyx over 9 mm. wide in  
 anthesis; leaf-blades mani-  
 festly serrulate; anther-awns  
 less than one half as long as  
 the sacs.  
 Calyx less than 9 mm. wide in  
 anthesis; leaf-blades ob-  
 scurely serrulate; anther-  
 awns over one half as long  
 as the sacs.  
 Calyx-lobes deltoid.  
 Filaments as long as the anthers or shorter.
4. *G. sphagnicola*.  
 5. *G. domingensis*.  
 6. *G. angustifolia*.  
 7. *G. acuminata*.  
 8. *G. longipes*.  
 9. *G. nitida*.  
 10. *G. glaucifolia*.  
 11. *G. Nelsonii*.  
 12. *G. setosa*.  
 13. *G. gracilis*.  
 14. *G. barbata*.  
 15. *G. parvifolia*.  
 16. *G. glandulifera*.  
 17. *G. lancifolia*.  
 18. *G. hirtiflora*.  
 19. *G. odorata*.  
 20. *G. costaricensis*.  
 21. *G. Rosei*.  
 22. *G. hidalgensis*.  
 23. *G. trichocalycina*.



Corolla relatively large, over 8 mm. long; plant of the Pacific coast region from Alaska to California. 24. *G. Shallon*.

1. *Gaultheria humifusa* (Graham) Rydb. Mem. N. Y. Bot. Gard. 1: 300. 1900.

*Vaccinium humifusum* Graham, Edinb. New Phil. Jour. 11: 193. 1831.  
*Gaultheria Myrsinites* Hook. Fl. Bor. Am. 2: 35. 1834.

A depressed or cespitose shrub mostly less than 1 dm. tall, glabrous or nearly so; leaf-blades oval or suborbicular, 1–2 cm. long, rounded, obtuse, or acutish at the apex, entire or obscurely toothed, abruptly narrowed or truncate at the base, very short-petioled; calyx 7–8 mm. broad, the lobes ovate, usually abruptly pointed, glabrous; corolla about 4 mm. long, slightly exceeding the calyx, the lobes ovate, usually fully as long as the tube; stamens about 2 mm. long; fruits 5–7 mm. in diameter, scarlet.

TYPE LOCALITY: Canadian Rocky Mountains; grown from seed in the botanical garden at Edinburgh.

DISTRIBUTION: Alberta and British Columbia to Colorado and Washington.

2. *Gaultheria ovatifolia* A. Gray, Proc. Am. Acad. 19: 84. 1883.

A diffuse shrub 3 dm. tall or less, more or less pubescent with reddish hairs; leaf-blades ovate or orbicular-ovate, or some of them reniform, mostly 2–3 cm. long, acute or short-acuminate, toothed, usually conspicuously so, truncate to subcordate at the base, short-petioled; calyx 7–8 mm. broad, the lobes triangular to ovate-lanceolate, acute or slightly acuminate, finely pubescent; corolla 4.5–5 mm. long, much exceeding the calyx, the lobes ovate, nearly as long as the tube; stamens 2.5–3 mm. long; fruits 7–9 mm. in diameter, scarlet.

TYPE LOCALITY: Cascade Mountains, British Columbia to Oregon.

DISTRIBUTION: British Columbia to Idaho and Oregon.

ILLUSTRATION: Brown & Schäffer, Alp. Pl. Can. pl. 58, b.

3. *Gaultheria procumbens* L. Sp. Pl. 395. 1753.

A low glabrous or minutely pubescent shrub, with creeping stems (rootstocks), the branches erect or ascending, 3–15 mm. high, rarely branching, leafy at the top; leaf-blades leathery, oval or elliptic, varying to ovate or obovate, retuse or often apiculate, crenate or serrate with bristle-tipped teeth, deep-green or commonly variegated above, narrowed into short petioles; pedicels 4–8 mm. long, recurved, with 2 broadly ovate scales; calyx white, 3–4 mm. wide, the lobes ovate, acutish, ciliolate; corolla white, wax-like, ovoid, 6–9 mm. long, with a flat base, the tube constricted at the throat, the lobes ovate, obtuse, recurved, villous within; filaments densely villous; fruits subglobose, 7–11 mm. in diameter, bright-red or white, spicy.

TYPE LOCALITY: Canada.

DISTRIBUTION: Newfoundland to Manitoba, Georgia, and Michigan.

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 367; Andr. Bot. Repos. pl. 116; Nouv. Duham. 1: pl. 12; Bot. Mag. pl. 1966; Bot. Cab. pl. 82; Barton, Veg. Mat. Med. pl. 15; Bigel. Am. Med. Bot. pl. 22; Britt. & Brown, Ill. Fl. f. 2775; ed. 2. f. 3248; Mathews, Field Book 331.

4. *Gaultheria sphagnicola* Rich. Act. Soc. Hist. Nat. Paris 1:

109. 1792.

? *Brossaea coccinea* L. Sp. Pl. 1190. 1753.

*Epigaea cordifolia* Sw. Prodr. 73. 1788.

? *Gaultheria cordifolia* Raeusch. Nom. ed. 3. 124, *nomen*. 1797. Not *G. cordifolia* H. B. K. 1819.

*Brossaea anastomosans* Griseb. Fl. Brit. W. Ind. 142. 1859. Not *Gaultheria anastomosans* H. B. K. 1819.

*Gaultheria coccinea* Urban, Symb. Ant. 3: 330, in part. 1902. Not *G. coccinea* H. B. K. 1819.

A depressed much-branched shrub, with red-hirsute twigs; leaf-blades ovate to suborbicular, 1–2.5 cm. long, or individually smaller, leathery, abruptly gland-tipped, ciliate-serrulate, deep-green above, paler beneath, pubescent along the veins, reticulate at maturity, rounded to subcordate at the base, short-petioled; panicles few-flowered, mostly 1–3 cm. long, the rachis and branches red-hirsute; bracts ciliate; calyx 7–9 mm. wide, the lobes ovate, becoming ovate-lanceolate, acuminate; corolla urceolate, 5–6.5 mm. long, crimson, glabrous, the lobes slightly recurved; fruits globular, 4.5–5.5 mm. in diameter.

TYPE LOCALITY: Guadeloupe.

DISTRIBUTION: Guadeloupe; Martinique; also in Trinidad and northern South America.

5. *Gaultheria domingensis* Urban, Symb. Ant. 3: 329. 1902.

A low or depressed much-branched shrub, with brown-hirsute twigs; leaf-blades ovate, varying to orbicular-ovate or somewhat reniform, leathery, 1.5–3.5 cm. long, abruptly gland-tipped, light-green on both sides, pubescent, especially along the veins, or glabrous above in age, becoming reticulate, rounded or subcordate at the base, short-petioled; panicles 1–5 cm. long, the rachis coarsely pubescent, the branches minutely pubescent; bracts ciliate; calyx 10–12 mm. wide, the lobes lanceolate, acuminate, ciliolate; corolla reddish, urceolate, 7–8 mm. long, pubescent, the lobes slightly recurved; filaments pubescent; fruits about 4 mm. in diameter.

TYPE LOCALITY: Haïti.

DISTRIBUTION: Hispaniola.

6. *Gaultheria angustifolia* Brand. Zoe 5: 251. 1908.

A much-branched slightly viscid shrub, with pubescent twigs; leaf-blades narrowly lanceolate to linear-elliptic, 2–5 cm. long, leathery, slightly acuminate, glandular at the tip, bristly-serrulate, deep-green above, slightly paler beneath, reticulate, narrowed at the base, short-petioled; panicles 2–4 cm. long, the rachis and branches glandular-hirsute; bracts ciliate; calyx 6–7 mm. wide, the lobes lanceolate, pubescent, acuminate; corolla urceolate, 6–7 mm. long, pubescent without, the lobes recurved; filaments pubescent; fruits not seen.

TYPE LOCALITY: Slopes of Ixtaccihuatl, Mexico.

DISTRIBUTION: Known only from the type locality.

7. *Gaultheria acuminata* Schlecht. & Cham. Linnaea 5: 126. 1830.

A branching shrub, with glabrous or sparingly pubescent twigs; leaf-blades oblong, oval, or ovate, 4–11 cm. long, short-acuminate, reticulate in age, leathery, bright-green above, slightly paler beneath, glabrous, at least at maturity, obscurely serrulate, abruptly narrowed or rounded at the base, short-petioled; panicles 4–11 cm. long, the rachis and branches finely pubescent; bracts pubescent, but scarcely ciliolate; calyx 5–6 mm. wide, the lobes deltoid, minutely pubescent, acute; corolla urceolate, 7–8 mm. long, sparingly pubescent without, the lobes ovate, recurved; filaments (glabrous) fruits not seen. *not true*

TYPE LOCALITY: Cerro Colorado, near Jalapa, Vera Cruz.

DISTRIBUTION: Vera Cruz.

8. *Gaultheria longipes* Small, sp. nov.

A shrub with slender branches and rather sparingly short-hirsute twigs; leaf-blades ovate, oblong-ovate, or ovate-lanceolate, 1.5–6 cm. long, acute or short-acuminate, bristly-serrulate, bright-green above, pale-green beneath, glabrous at maturity, or with scattered hairs on the veins, finely reticulate in age, rounded or subcordate at the base, short-petioled; panicles 4–6 cm. long, lax, the rachis minutely pubescent and with longer gland-tipped hairs, the long (1–2 cm.) branches similarly pubescent; bracts ciliate, and glandular-pubescent on the back; calyx 5–6 mm. wide, the lobes ovate, acute, finely pubescent and with scattered longer gland-tipped hairs; corolla pinkish, urceolate, 6.5–7.5 mm. long, minutely pubescent, the lobes slightly recurved; filaments pubescent; capsules 3–4 mm. in diameter.

Type collected on cool ledges, Sierra de Tepoxtlán, Morelos, Mexico, September 5, 1900, *Pringle 8441* (herb. N. Y. Bot. Gard.).

9. *Gaultheria nitida* Benth. Pl. Hartw. 45. 1840.

*Gaultheria laevigata* Mart. & Gal. Bull. Acad. Brux. 9: 541. 1842.

An erect branching shrub with glabrous or nearly glabrous twigs; leaf-blades oblong to ovate-oblong, or sometimes slightly broadest above the middle, 3–11 cm. long, obtuse or acute, obscurely toothed, bright-green, somewhat shining above, glabrous or nearly so, rounded at the base, short-petioled; panicles 4–8 cm. long, the rachis puberulent; bracts ciliolate; calyx 4–6 mm. wide, the lobes ovate or triangular-ovate, acuminate, glabrous, except the ciliolate lobes; corolla pinkish, urceolate, 7–8 mm. long, minutely pubescent, the lobes slightly recurved; filaments pubescent; capsules 3–4 mm. in diameter.

TYPE LOCALITY: El Banco, Hidalgo.

DISTRIBUTION: Mexico.



10. *Gaultheria glaucifolia* Hemsl. Biol. Centr. Am. Bot. 2:  
281. 1881.

A much-branched shrub with glabrous twigs; leaf-blades ovate to somewhat oblong-ovate, 2.5–5 cm. long, thick, abruptly pointed or acute, or sometimes obtuse, entire or obscurely toothed, glabrous, glaucous, rounded or slightly cordate at the base, short-petioled; panicles few-flowered, the rachis and branches glabrous; calyx sparingly pubescent with short hairs, the lobes ovate or ovate-lanceolate, acutish; corolla and stamens not seen; capsules spheroidal.

TYPE LOCALITY: Sierra Madre, western Mexico.

DISTRIBUTION: Known only from the type locality.

11. *Gaultheria Nelsonii* Small, sp. nov.

A branching shrub with glabrous twigs; leaf-blades oblong, varying to slightly broadest above the middle or below it, 4–11 cm. long, thick, acute or slightly acuminate, gland-tipped, serrulate, often shallowly so, glabrous, somewhat shining above, slightly paler and dull beneath, rounded or subcordate at the base, short-petioled; panicles 5–8 cm. long, loosely flowered, the rachis glabrous, the branches glabrous and often slightly glaucous; calyx 6.5–7.5 mm. wide, the lobes deltoid to triangular-ovate, acuminate, glabrous, or the margins inconspicuously ciliate; corolla pink, ovoid-urceolate, 4.5–5.5 mm. long, glabrous, the lobes recurved; filaments slightly dilated below, pubescent; capsules not seen.

Type collected near Totontepec, Oaxaca, Mexico, July, 1894, *E. W. Nelson* 822 (U. S. Nat. Herb.).

DISTRIBUTION: Oaxaca, Mexico.

12. *Gaultheria setosa* Small, sp. nov.

A much-branched shrub with copiously setose twigs; leaf-blades elliptic, varying to elliptic-lanceolate, 3–6 cm. long, thinnish, acuminate at both ends, gland-tipped, rather obscurely serrulate, somewhat shining on both sides, pubescent with scattered bristle-like hairs at least when young, glabrous or nearly so in age, short-petioled; panicles 2–5 cm. long, loosely flowered, the rachis slender, sparingly pubescent, the branches glabrous; calyx 6–7 mm. wide, the lobes triangular-lanceolate, acuminate, glabrous, except the sometimes obscurely ciliolate margins; corolla pinkish, 4.5–5.5 mm. long, glabrous, the lobes recurved; filaments stout, dilated below, glabrous; capsules not seen.

Type collected around Los Sigüas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, altitude about 1700 m., March, 1911, *H. Pittier* 3245 (U. S. Nat. Herb.).

DISTRIBUTION: Panama.

13. *Gaultheria gracilis* Small, sp. nov.

A much-branched shrub with copiously strigose twigs; leaf-blades elliptic or ovate-elliptic, 2–4.5 cm. long, thinnish, acuminate at both ends, gland-tipped, obscurely serrulate, somewhat shining above, dull beneath, pubescent with long scattered hairs at least when young, short-petioled; panicles 2–5 cm. long, loosely flowered, the rachis closely fine-pubescent, the branches rather more sparingly pubescent than the rachis; calyx 5–6 mm. wide, the lobes lanceolate to triangular-lanceolate, acuminate, finely pubescent, ciliate; corolla about 4 mm. long, pubescent with short stiff hairs; filaments dilated below, pubescent (?); capsules spheroidal, 2–2.5 mm. in diameter.

Type collected at La Palma, Costa Rica, altitude 1550 m., August, 1898, *A. Tonduz* 7463 (U. S. Nat. Herb.).

DISTRIBUTION: Costa Rica.

14. *Gaultheria barbata* Small, sp. nov.

A much-branched shrub with copiously shaggy long-hirsute twigs, the hairs glandless; leaf-blades elliptic or nearly so, 3–6 cm. long, thickish, somewhat acuminate, often prominently gland-tipped, slightly shining on both sides, paler beneath than above, shallowly serrate, with few bristle-like hairs, rather prominently ribbed and thinly reticulate, somewhat acuminate at the base, short-petioled; panicles 4–7 cm. long, rather loosely flowered, the

rachis short-villous, the branches more finely pubescent; bracts ciliolate, glabrous, at least in age; calyx 6–7 mm. wide, the lobes deltoid to ovate-deltoid, acute, puberulent, ciliolate, the hairs glandless; corolla pink (?), conic-urceolate, 6–7 mm. long, minutely pubescent with glandless hairs, the lobes recurved; filaments somewhat dilated, pubescent about the middle; capsules not seen.

Type collected on Volcan de Poás, Costa Rica, March 31, 1907, *H. Pittier 2051* (U. S. Nat. Herb.).

DISTRIBUTION: Costa Rica.

### 15. *Gaultheria parvifolia* Small, sp. nov.

A much-branched shrub with minutely pubescent and somewhat hirsute twigs; leaf-blades oblong to ovate-oblong, 1–2.5 cm. long, thinnish, acute or acutish, serrulate, dull on both sides, reticulate beneath, sparingly pubescent, ciliate, rounded at the base, short-petioled; panicles 2–3 cm. long, loosely flowered, the rachis minutely pubescent and sparingly hirsute, the branches similarly pubescent; calyx about 7 mm. wide, the lobes deltoid or ovate-deltoid, acuminate, glabrous or nearly so, except the ciliolate margins; corolla pink, ovoid-urceolate, 6–7 mm. long, pubescent; filaments dilated below, copiously pubescent; capsules not seen.

Type collected in Oaxaca, Mexico, *H. Galeotti 1848* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Oaxaca.

### 16. *Gaultheria glandulifera* Small, sp. nov.

A branching shrub with more or less short-hirsute twigs, the hairs gland-tipped; leaf-blades oblong, elliptic, or broadly ovate, 4–9 cm. long, very thick, each abruptly tipped with a large apical gland, serrate-crenate, sometimes obscurely so, often somewhat shining above, often with colored veins, usually sparingly pubescent about the veins, especially beneath, abruptly narrowed or rounded at the base, short-petioled; panicles 4–8 cm. long, loosely flowered, the rachis finely pubescent with short crisped white hairs, the branches similarly pubescent; bracts relatively large, puberulent, at least when young, more or less glandular-ciliate; calyx 9–10 mm. wide, the lobes lanceolate to triangular-lanceolate, acuminate, finely pubescent and ciliolate, the hairs glandless; corolla pink (?), ovoid-urceolate, 6–7 mm. long, minutely pubescent with glandless hairs, the lobes spreading or recurved; filaments dilated below, pubescent throughout; capsules spheroidal, 2.5–3 mm. in diameter.

Type collected on Volcan de Poás, Costa Rica, March, 1896, *John Donnell Smith 6639* (herb. Columbia Univ.).

DISTRIBUTION: Costa Rica.

### 17. *Gaultheria lancifolia* Small, sp. nov.

A much-branched shrub, finely soft-pubescent with glandless or inconspicuously glandular hairs; leaf-blades lanceolate or oblong-lanceolate or individually ovate-lanceolate, 2–8 cm. long, acutish or somewhat acuminate, gland-tipped, thickish, serrulate, dull on both sides, glabrous or sparingly fine-pubescent, mostly rounded at the base, short-petioled; panicles 4–8 cm. long, rather loosely flowered, the rachis finely glandular-pubescent with short spreading hairs, the branches similarly pubescent; calyx 8–9 mm. wide, the lobes deltoid to broadly ovate, acute or short-acuminate, somewhat puberulent and ciliolate; corolla ovoid-urceolate, 5–7 mm. long, finely glandular-pubescent, the lobes recurved; filaments dilated below, sparingly pubescent about the middle; capsules spheroidal, 5–6 mm. in diameter.

Type collected at Salto de Agua, Mexico, January, 1906, *C. A. Purpus 1774* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Central Mexico.

### 18. *Gaultheria hirtiflora* Benth. Pl. Hartw. 66. 1840.

*Gaultheria cordata* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 540. 1842.

An erect or somewhat spreading shrub with brown-hirsute twigs: leaf-blades ovate, oblong-ovate, ovate-lanceolate, or lanceolate, 3–9 cm. long, leathery, abruptly gland-tipped or short-acuminate, obscurely toothed; more or less reticulate in age, pubescent when young,



glabrous or nearly so when mature, rounded or subcordate at the base, short-petioled; panicles 3–6 cm. long, the rachis glandular-hirsute; bracts minutely glandular-pubescent on the back; calyx 7–9 mm. wide, the lobes ovate to broadly lanceolate, acute, pubescent; corolla reddish, urceolate, 6–7 mm. long, coarsely pubescent, the lobes slightly spreading or recurved; filaments pubescent; capsules 4–5 mm. in diameter.

TYPE LOCALITY: Carmen, Oaxaca.

DISTRIBUTION: Mexico to Guatemala.

19. *Gaultheria odorata* Willd. Ges. Nat. Freunde Berlin Neue  
Schr. 3: 425. 1801.

*Gaultheria odorata mexicana* DC. Prodr. 7: 595. 1839.

*Gaultheria Hartwegiana* Loesener, Bull. Herb. Boiss. II. 3: 217. 1903.

A shrub with irregular branches, the branchlets finely pubescent and often with longer gland-tipped hairs; leaf-blades ovate to oblong-ovate or oval-ovate, 1.5–4.5 cm. long, thick, abruptly narrowed at the apex or short-acuminate, rather prominently gland-tipped, serrulate, dull on both sides, reticulate, sparingly fine-pubescent or glabrous in age, rounded or truncate at the base, short-petioled; panicles 3–6 cm. long, loosely flowered, the rachis closely fine-pubescent and with longer gland-tipped hairs, the branches similarly pubescent; calyx 7.5–8.5 mm. wide, the lobes ovate, acute or slightly acuminate, glandular-pubescent, ciliolate; corolla pink, ovoid-urceolate, 6–7 mm. long, glandular-pubescent, the lobes recurved; filaments slender, dilated near the base, pubescent; capsules spheroidal, about 5 mm. in diameter.

TYPE LOCALITY: Near Caracas, Venezuela.

DISTRIBUTION: Mexico to northern South America.

ILLUSTRATION: Hemsl. Biol. Centr. Am. Bot. pl. 53, A, f. 1–3.

20. *Gaultheria costaricensis* (Donn. Smith) Small, sp. nov.

*Gaultheria odorata costaricensis* Donn. Smith, Bot. Gaz. 20: 292. 1895.

A shrub with stout irregular branches and finely pubescent twigs; leaf-blades ovate or oval, varying to suborbicular or orbicular-reniform, leathery, 2–7 cm. long, abruptly pointed or short-acuminate, serrulate, deep-green and somewhat shining above, paler and dull beneath, finely reticulate, sparingly pubescent when young, glabrous or nearly so at maturity, abruptly narrowed or rounded at the base, short-petioled; panicles 6–10 cm. long, the rachis glandular-pubescent, the branches less than 1 cm. long, or slightly more than 1 cm. long in fruit; bracts glandular-pubescent, becoming glabrous; calyx 9–11 mm. wide, the lobes lanceolate, acuminate, glandular-pubescent; corolla pink, urceolate, about 6–7 mm. long, copiously pubescent, the lobes recurved; filaments finely pubescent; capsules 6–8 mm. in diameter.

TYPE LOCALITY: Estrella, Costa Rica.

DISTRIBUTION: Costa Rica.

21. *Gaultheria Rosei* Small, sp. nov.

A low branching shrub with glandular-pubescent twigs; leaf-blades various, the lower ones orbicular or oval, the upper ones oblong or slightly broadened upward, all abruptly pointed or acute, thinnish, obscurely serrulate, minutely pubescent, at least when young, reticulate, pale-green, sometimes glaucescent, abruptly narrowed or rounded at the base, short-petioled; panicles 4–7 cm. long, loosely flowered, the rachis and branches finely glandular-hirsute; calyx 7–8 mm. wide, the lobes lanceolate to triangular-lanceolate, acute or slightly acuminate, glandular-pubescent; corolla pink, ovoid-urceolate, about 7 mm. long, glandular-pubescent; filaments dilated below, pubescent throughout; capsules spheroidal, 3–4 mm. in diameter.

Type collected near Santa Teresa, Territorio de Tepic, Mexico, August 11, 1897, J. N. Rose 2183 (U. S. Nat. Herb.).

DISTRIBUTION: Known only from the type locality.

22. *Gaultheria hidalgensis* Loesener, Bull. Herb. Boiss. 2:  
552. 1894.

A much-branched shrub, the branches minutely pubescent and more or less hirsute with red gland-tipped hairs; leaf-blades lanceolate, oblong-lanceolate, ovate-lanceolate, or ovate,

3–9 cm. long, thick, acute or short-acuminate, gland-tipped, obscurely serrulate or nearly entire, dull on both sides, somewhat reticulate, sparingly pubescent, with the hairs along the edge and near the petiole longer and gland-tipped, rounded or subcordate at the base, short-petioled; panicles 3–11 cm. long, loosely flowered, the rachis glandular-hirsute, the branches less copiously pubescent; calyx 6–7 mm. wide, the lobes deltoid, acute, glandular-pubescent, ciliate; corolla pink (?), ovoid-urceolate, 6.5–7.5 mm. long, glandular-pubescent, the lobes recurved; filaments stout, slightly dilated, pubescent; capsules spheroidal, 4–5 mm. in diameter.

TYPE LOCALITY: Near Othamalacatlé, Hidalgo.

DISTRIBUTION: Southern Mexico and Guatemala.

ILLUSTRATIONS: Hemsl. Biol. Centr. Am. Bot. *pl.* 53, *B*, 4–6; Bull. Herb. Boiss. 2: *pl.* 20, *f.* 13.

### 23. *Gaultheria trichocalycina* DC. Prodr. 7: 595. 1839.

A branching shrub with finely glandular-pubescent twigs; leaf-blades ovate, usually broadly so, 1–3 cm. long, thickish, acute, usually abruptly gland-tipped, shallowly serrulate, dull on both sides, reticulate, finely pubescent on both sides, or nearly glabrous at maturity, deeply cordate at the base, short-petioled; panicles 4–8 cm. long, rather loosely flowered, the rachis glandular-hirsutulous, the branches similarly pubescent; calyx 6.5–7.5 mm. wide, the lobes ovate, acute, glandular-pubescent, ciliate; corolla ovoid-urceolate or globose-urceolate, 6–7 mm. long, glandular-pubescent, the lobes recurved; filaments stout, short-pubescent; capsules not seen.

TYPE LOCALITY: Between Pueblo Viejo, Vera Cruz, and Real del Monte, Hidalgo.

DISTRIBUTION: Middle Mexico.

### 24. *Gaultheria Shallon* Pursh, Fl. Am. Sept. 284. 1814.

A diffuse shrub with stoutish branches and copiously glandular-pubescent twigs; leaf-blades ovate, oval, orbicular-ovate, suborbicular, or individually somewhat reniform, leathery, 2–13 cm. long, abruptly pointed or short-acuminate, glabrous at least at maturity, veiny beneath when old, distinctly serrulate, abruptly narrowed, rounded or subcordate at the base, short-petioled; panicles mostly 7–15 cm. long, the rachis copiously glandular-pubescent, the branches short (less than 1 cm.), stout, pubescent like the rachis; bracts more or less pubescent, and ciliate; calyx 6–8 mm. wide, the lobes ovate to triangular-lanceolate, acute or slightly acuminate, pubescent; corolla white or pink, urceolate, 8.5–11 mm. long, pubescent, the lobes recurved; filaments pubescent; fruits purple, becoming black; capsules 5–7 mm. in diameter.

TYPE LOCALITY: Falls of the Columbia River.

DISTRIBUTION: Alaska and British Columbia to southern California.

ILLUSTRATIONS: Pursh, Fl. Am. Sept. *pl.* 12; Bot. Mag. *pl.* 2843; Bot. Reg. *pl.* 1411; Bot. Cab. *pl.* 1372; Lounsberry, Guide Wild Fl. *pl.* 88.

#### DOUBTFUL SPECIES

GAULTHERIA OVATA DC. Prodr. 7: 596. 1839.

GAULTHERIA LONGIFOLIA Morren, Ann. Soc. Hort. Gand 1: 441. *pl.* 43, *f.* 2. 1845.  
Nativity not known.

GAULTHERIA INSIPIDA Benth. Pl. Hartw. 225. 1846.

### 34. *ERICA* L. Sp. Pl. 352. 1753.

Shrubs or partially woody plants, with much-branched stems. Leaves small, usually numerous and approximate, whorled or apparently whorled; blades often narrow, and apparently very narrow by the strongly revolute margins, short-petioled. Flowers solitary or in terminal clusters. Calyx persistent; lobes usually 4, much longer than the tube, equal or nearly so. Corolla urceolate to cylindric; lobes usually 4, very short. Stamens usually 8, included; filaments slender; anthers short, appendaged or unappendaged. Ovary usually 4-celled, somewhat lobed, globular or slightly elongate; style slender; stigma mostly 4-lobed. Capsule globose or nearly so, included in the more or less persistent corolla.

Type species, *Erica cinerea* L.

Leaves whorled in 3's; calyx glabrous or nearly so; anther-appendages toothed.  
Leaves whorled in 4's; calyx copiously pubescent; anther-appendages entire.

1. *E. cinerea*.  
2. *E. Tetralix*.



1. *Erica cinerea* L. Sp. Pl. 352. 1753.

A shrub mostly 4 dm. tall or less, with minutely and inconspicuously pubescent branches; leaves whorled in 3's, the blades linear to subulate on account of the strongly revolute margins, 2–7 mm. long, acute, glabrous or nearly so; flowers in racemed or paniced clusters; calyx-lobes linear-lanceolate to subulate, 2.5–3 mm. long, ciliolate, sometimes obscurely so; corolla reddish-purple, 6–7 mm. long; filaments mostly 4.5–5 mm. long; capsules 2–2.5 mm. in diameter.

TYPE LOCALITY: Middle Europe.

DISTRIBUTION: Nantucket Island, Massachusetts; presumably naturalized from Europe.

ILLUSTRATIONS: Fl. Dan. *pl.* 38; Engl. Bot. *pl.* 1015.

2. *Erica Tetralix* L. Sp. Pl. 353. 1753.

A shrub mostly less than 3 dm. tall, with closely fine-pubescent and also more or less hirsutulous branches; leaves whorled in 4's, the blades oblong to linear, often very narrow on account of the revolute margins, pubescent like the branches, with the long hairs often gland-tipped; flowers in terminal clusters; calyx-lobes linear to oblong-linear, 2.5–3 mm. long, minutely pubescent, ciliolate, and ciliate with several long gland-tipped hairs; corolla pink, 6–8 mm. long; filaments 4–6 mm. long; capsules 2.5–3 mm. long.

TYPE LOCALITY: Northern Europe.

DISTRIBUTION: Nantucket Island, Massachusetts; presumably naturalized from Europe.

ILLUSTRATIONS: Fl. Dan. *pl.* 81; Baxter, Brit. Bot. 6: *pl.* 418.

35. *CALLUNA* Salisb. Trans. Linn. Soc. 6: 317. 1802.

Partly woody plants with diffuse stems and branches. Leaves small, opposite, often 4-ranked, very numerous; blades narrow, entire, sessile, usually auricled at the base, somewhat keeled and grooved beneath. Flowers in terminal, elongate, spike-like or raceme-like panicles. Calyx persistent, scarious in age; lobes 4, petaloid, much longer than the tube, equal or nearly so. Corolla similar to the calyx, but smaller, persistent and scarious like the calyx; lobes 4, much longer than the tube. Stamens 8, shorter than the calyx; filaments slender, unappendaged; anthers narrow, with deflexed appendages on the back. Ovary 4-celled, lobed; style slender; stigma 4-lobed. Capsules slightly depressed, 4-valved, included in the persistent perianth.

Type species, *Erica vulgaris* L.

1. *Calluna vulgaris* (L.) Hull, Brit. Fl. 114. 1808.

*Erica vulgaris* L. Sp. Pl. 352. 1753.

*Calluna atlantica* Seem. Jour. Bot. 4: 305. 1866.

A much-branched evergreen diffuse shrub less than 4 dm. tall, growing in large tufts; leaves 4-ranked, green or grayish, the blades ovate to lanceolate, 1–3 mm. long, finely pubescent, clasping; flowers spreading or nodding, the subtending bracts sepal-like, the inner ones scarious, ciliate; calyx becoming 5.5–6.5 mm. wide, the lobes oblong, oval, or ovate, obtuse; corolla included in the calyx, the lobes ovate to lanceolate, shorter than the calyx-lobes; stamens 2–2.5 mm. long; capsule 1.5–2 mm. broad.

TYPE LOCALITY: Europe.

DISTRIBUTION: Coastal region, Newfoundland to New Jersey; presumably naturalized from Europe.

ILLUSTRATIONS: Fl. Dan. *pl.* 677; Hayne, Arzn. Gew. 4: *pl.* 17; Britt. & Brown, Ill. Fl. f. 2778; ed. 2. f. 3251; Meehan's Mo. 9: *pl.* 5.

36. *PERNETTIA* Gaud. Ann. Sci. Nat. 5: 102. 1825.

Shrubs with erect or depressed stems. Leaves alternate, persistent; blades leathery, narrow or broad, toothed, nearly flat, short-petioled. Flowers one or few together in raceme-like inconspicuous panicles at the ends of the branchlets, nodding. Calyx persistent; lobes 5, broad, often ciliolate. Corolla urceolate, ovoid or subglobose, white or pink; lobes 5, very short, recurved. Stamens 10, included; filaments dilated below; anthers mostly oblong or oval, opening at the top, appendaged at the top. Ovary 5-celled, usually spheroidal; style columnar; stigma minute. Berry nodding, subglobose.

Type species, *Arbutus pumila* Forst.

Branchlets hirsute-setose.

Branchlets strigose-setose.

1. *P. ciliata*.

2. *P. coriacea*.

### 1. *Pernettia ciliata* (Schlecht. & Cham.) Small.

*Gaultheria ciliata* Schlecht. & Cham. *Linnaea* 5: 126. 1830.

*Pernettia pilosa* G. Don, *Gen. Hist.* 3: 837. 1834.

*Pernettia ciliaris* G. Don, *Gen. Hist.* 3: 837. 1834.

? *Pernettia Seleriana* Loesener, *Bull. Herb. Boiss.* II. 3: 217. 1903.

A low shrub with hirsute-setose branchlets; leaf-blades oblong to oval, varying to broadest above or below the middle, mostly 1–2 cm. long, acute or obtuse, crenate-serrate, smooth and shining above, dull and sparingly setose or glabrous beneath; calyx-lobes ovate to ovate-lanceolate, 3–3.5 mm. long; corolla 5–7 mm. long; stamens 4–5 mm. long; berries subglobose, 6–7 mm. in diameter.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Mexico.

ILLUSTRATION: *Jour. Hort. Soc. London* 6: 268.

### 2. *Pernettia coriacea* Klotzsch, *Linnaea* 24: 85. 1851.

A low or depressed shrub with strigose-setose branchlets or glabrous; leaf-blades ovate, oblong-ovate, or oblong, mostly 1–2 cm. long, usually acute, serrate or crenate-serrate, shining above, dull and glabrous or nearly so beneath, reticulate in age; calyx-lobes ovate to lanceolate, 3.5–4 mm. long; corolla 5–7 mm. long; stamens 3–4 mm. long; berries subglobose, 5–7 mm. in diameter.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Costa Rica and Panama.

#### DOUBTFUL SPECIES

PERNETTIA SETIGERA Klotzsch, *Linnaea* 24: 85. 1834.

PERNETTIA BUXIFOLIA Mart. & Gal. *Bull. Acad. Brux.* 9<sup>1</sup>: 538. 1842.

PERNETTIA OVATA Fernald, *Proc. Am. Acad.* 36: 496 (1901), is a *Vaccinium*.

### 37. *ARBUTUS* L. *Sp. Pl.* 395. 1753.

Shrubs or trees, with diffuse, ascending or erect stems, the bark of the trunk either fissured or smooth and exfoliating. Leaves alternate, persistent; blades narrow or broad, usually leathery, entire or toothed, mostly long-petioled. Flowers perfect, in terminal compound panicles, the panicles sometimes cluster-like. Calyx rather persistent; lobes 5, much longer than the tube, often thin-edged, equal or nearly so. Corolla white or pale, urceolate, of an ovoid or globular type; tube swollen; lobes 5, spreading or recurved, rounded, much shorter than the tube. Stamens 10, included; filaments dilated at the base, usually pubescent, unappendaged; anthers broad, each with 2 slender awns. Disk usually 10-lobed. Ovary sessile, usually 5-celled; style columnar or subulate; stigma somewhat capitate, obscurely 5-lobed. Ovules numerous, at the inner angle of each ovary-cavity. Berry globular or depressed, or rarely slightly elongate, with a rough-granular coat.

Type species, *Arbutus Unedo* L.

Leaf-blades glabrous, sometimes glaucous.

Leaf-blades entire or obscurely toothed, except on shoots.

Ovary glabrous.

Corolla globular-urceolate; leaf-blades more or less glaucous beneath; panicles many-flowered.

Corolla ovoid-urceolate; leaf-blades not glaucous; panicles few-flowered.

Ovary pubescent.

Leaf-blades sharply serrate or crenate-serrate.

Leaf-blades pubescent, at least beneath.

Inflorescence-branches canescent or tomentose, with or without some gland-tipped hairs.

Ovary pubescent.

Leaf-blades canescent or tomentose beneath, sometimes mainly along the midrib, at maturity.

Calyx-lobes suborbicular or orbicular-ovate, obtuse; leaf-blades entire or obscurely toothed.

Calyx-lobes triangular, acute or acuminate; leaf-blades serrate, the teeth sometimes spine-tipped.

Leaf-blades lanuginous beneath.

1. *A. Menziesii*.

2. *A. arizonica*.

3. *A. xalapensis*.

4. *A. prunifolia*.

3. *A. xalapensis*.

5. *A. spinulosa*.

6. *A. mollis*.



Ovary glabrous.

Inflorescence-branches finely pubescent or tomentulose with glandless hairs.

Leaf-blades entire or nearly so, not reticulate.

Leaf-blades serrate with cartilaginous teeth, somewhat reticulate.

Inflorescence-branches with glandular-hairs mixed with the non-glandular pubescence.

Calyx pubescent and ciliolate; leaf-blades dull above; filaments long-villous.

Calyx glabrous or merely ciliolate; leaf-blades shining above; filaments short-villous.

Inflorescence-branches glandular-hirsute.

2. *A. arizonica*.

7. *A. laurina*.

8. *A. Donnell-Smithii*.

9. *A. peninsularis*.

10. *A. glandulosa*.

### 1. *Arbutus Menziesii* Pursh, Fl. Am. Sept. 282. 1814.

*Arbutus procera* Dougl.; Lindl. Bot. Reg. 21: pl. 1753. 1836.

A tree 30 m. tall or less, or a shrub, the bark of the trunk dark reddish-brown, the branchlets bright reddish-brown; leaves dark-green, at least above, the blades oval or ovate, or sometimes oblong, 5–12 cm. long, obtuse or acutish, glabrous, or sparingly fine-pubescent especially when young, abruptly narrowed, rounded, truncate or sub-cordate at the base, rather long-petioled; panicles 6–14 cm. long, the rachis and pedicels closely fine-pubescent or puberulent; calyx 5–6 mm. wide, the lobes ovate, obtuse or acutish; corolla 7–8 mm. long; stamens 3.5–4 mm. long, the filaments villous; ovary glabrous; berries globose, varying sometimes to oval or obovoid, 10–13 mm. long, orange-red.

TYPE LOCALITY: Northwest coast of America.

DISTRIBUTION: British Columbia to California.

ILLUSTRATIONS: Lindl. Bot. Reg. 21: pl. 1753; Paxt. Fl. Mag. 2: pl. 147; Sarg. Silva pl. 231; Sarg. Man. f. 586; Jepson, Trees Calif. f. 115; Mem. Univ. Calif. 2: pl. 82, 83; Eastw. Handb. Trees Calif. pl. 53; Britton, N. Am. Trees f. 693.

### 2. *Arbutus arizonica* (A. Gray) Sargent, Garden & Forest 4: 317. 1891.

*Arbutus xalapensis arizonica* A. Gray, Syn. Fl. N. Am. ed. 2. 2<sup>1</sup>: 396. 1886.

A tree 20 m. tall, the bark of the trunk ashy-gray or whitish, the branchlets red, or a shrub; leaves pale-green, the blades narrowly oblong, oblong-lanceolate, or lanceolate, 4–9 cm. long, mostly acute or acuminate, entire or obscurely toothed, glabrous, at least at maturity, abruptly narrowed or rounded at the base, rather slender-petioled; panicles 3–7.5 cm. long, the rachis and pedicels somewhat sparingly fine-pubescent; calyx 4–5 mm. wide, the lobes ovate, acute or acutish; corolla 6–7 mm. long; stamens about 3 mm. long, the filaments villous at the dilated base; ovary glabrous; berries globose or oval, 7–9 mm. long, orange-red.

TYPE LOCALITY: Mountains of southern Arizona.

DISTRIBUTION: Arizona and Sonora to Coahuila.

ILLUSTRATIONS: Gard. & Forest 4: f. 54; Sarg. Silva pl. 233; Sarg. Man. f. 588; Britton, N. Am. Trees f. 695.

### 3. *Arbutus xalapensis* H. B. K. Nov. Gen. & Sp. 3: 279. 1819.

? *Arbutus densiflora* H. B. K. Nov. Gen. & Sp. 3: 280. 1819.

? *Arbutus petiolaris* H. B. K. Nov. Gen. & Sp. 3: 281. 1819.

*Arbutus laurifolia* Lindl. Bot. Reg. 25: pl. 67. 1839.

*Arbutus rubescens* Bertol. Novi Comm. Acad. Bonon. 4: 420. 1840.

*Arbutus xalapensis pubescens* Benth. Pl. Hartw. 66. 1840.

*Arbutus varians* Benth. Pl. Hartw. 77. 1841.

? *Arbutus floribunda* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 534. 1842.

? *Arbutus macrophylla* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 534. 1842.

? *Arbutus paniculata* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 535. 1842.

*Comarostaphylis rubescens* Klotzsch, Linnaea 24: 77. 1851.

*Arbutus texana* Buckl. Proc. Acad. Phila. 1861: 460. 1862.

*Arctostaphylos rubescens* Hemsl. Biol. Centr. Am. Bot. 2: 279. 1881.

*Arbutus xalapensis texana* A. Gray, Syn. Fl. N. Am. ed. 2. 2<sup>1</sup>: 397. 1886.

? *Arbutus xalapensis petiolaris* Loesener, Bull. Herb. Boiss. II. 3: 219. 1903.

A tree mostly 15 m. tall or less, or a shrub, the bark of the trunk dark-brown or nearly black, the branchlets reddish; leaves deep-green, or pale beneath, the blades ovate, oval, or broadly oblong, varying to oblong-lanceolate or ovate-lanceolate, 4–11 cm. long, obtuse, ab-

ruptly pointed, or acute, entire or denticulate, abruptly narrowed, truncate, or subcordate at the base, glabrous or canescent or tomentose beneath, sometimes only along the midrib, at maturity, rather long-petioled; panicles 3–8 cm. long, the rachis and pedicels densely fine-pubescent, tomentose, canescent, or tomentulose, with or without some glandular hairs; calyx 4–6 mm. wide, the lobes suborbicular to orbicular-ovate, obtuse; corolla 7–8 mm. long, or rarely larger; stamens 3.5–4 mm. long, the filaments villous; ovary pubescent; berries globose or depressed, 8–12 mm. long, red.

TYPE LOCALITY: Near Xalapa, Vera Cruz.

DISTRIBUTION: Western Texas, Mexico, and Guatemala.

ILLUSTRATIONS: H. B. K. Nov. Gen. & Sp. 3: *pl.* 260 (*Arbutus densiflora*); Novi Comm. Acad. Bonon. 4: *pl.* 42 (*Arbutus rubescens*); Sarg. Silva *pl.* 232; Sarg. Man. *f.* 587; Britton, N. Am. Trees *f.* 694 (*Arbutus texana*).

#### 4. *Arbutus prunifolia* Klotzsch, Linnaea 24: 73. 1851.

A shrub or small tree, the branchlets becoming glabrous or nearly so; leaves bright-green, the blades oblong, oblong-ovate, or ovate, 3–8 cm. long, obtuse or acute, pubescent when young, becoming glabrous and reticulate-veiny above, often permanently pubescent beneath, serrate or crenate-serrulate, abruptly narrowed or rounded at the base, rather long-petioled; panicles few- or many-flowered, 3–7 cm. long, the rachis and pedicels finely pubescent; calyx 5.5–6.5 mm. wide, the lobes ovate, obtuse or acutish; corolla 6–7 mm. long; stamens 3–3.5 mm. long, the filaments villous; berries subglobose, 9–12 mm. long, red; berries globular, 10–13 mm. in diameter, red, granular-papillose.

TYPE LOCALITY: Near Real del Monte, Hidalgo.

DISTRIBUTION: Central Mexico.

#### 5. *Arbutus spinulosa* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 532. 1842.

A shrub; branchlets puberulent or finely pubescent; leaves bright-green, the blades oblong-lanceolate or oblong, varying to oblong-ovate, or obovate, 4–7 cm. long, or rarely larger, acutish, acute, or abruptly short-acuminate, slightly reticulate and ultimately glabrous above, more or less tomentulose beneath, serrate, with the teeth sometimes spine-tipped, abruptly narrowed or rounded at the base, relatively short-petioled, sometimes very short-petioled; panicles mostly 2–5 cm. long, often clustered, the rachis and pedicels finely pubescent; calyx 4–5 mm. wide, the lobes triangular, acute or acuminate; corolla 6–7 mm. long; stamens 2.5–3 mm. long, the filaments villous; berries not seen.

TYPE LOCALITY: Michoacan.

DISTRIBUTION: Western Mexico.

#### 6. *Arbutus mollis* H. B. K. Nov. Gen. & Sp. 3: 280. 1819.

A tree, the branchlets finely soft-pubescent; leaves deep-green, the blades oblong, often narrowly so, varying to broadest above or below the middle, 4–11 cm. long, or sometimes individually smaller, acute or obtuse, serrulate or shallowly serrate, finely and thinly pubescent above, reddish or brownish, canescent-tomentose beneath, attenuate or rounded at the base, rather long-petioled; panicles densely flowered, 3–6 cm. long, clustered, the rachis and pedicels tomentulose; calyx 6–7 mm. wide, the lobes ovate, obtuse or acutish; corolla 8–9 mm. long; stamens 3.5–4 mm. long, the filaments villous; berries not seen.

TYPE LOCALITY: Near Guanajuato, Guanajuato.

DISTRIBUTION: Central Mexico.

ILLUSTRATION: Bot. Mag. *pl.* 4595.

#### 7. *Arbutus laurina* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 535. 1842.

A tree, the branchlets glabrous or puberulent, red; leaves deep-green, the blades ovate-oblong to oblong, 2–9 cm. long, obtuse or acutish, serrate with cartilaginous-tipped teeth, glabrous and somewhat shining above, pubescent, especially along the midrib, beneath, abruptly narrowed or rounded at the base, rather long-petioled; panicles 4–8 cm. long, clustered,



the rachis and pedicels villous-tomentose; calyx 5–6 mm. wide, the lobes ovate, obtuse; corolla 6–7 mm. long; stamens 2.5–3 mm. long, the filaments villous; berries not seen.

TYPE LOCALITY: Yavezia, Oaxaca.

DISTRIBUTION: Southern Mexico.

#### 8. *Arbutus Donnell-Smithii* Small, sp. nov.

A shrub with tomentulose twigs; leaf-blades ovate or oval-ovate, 3–6 cm. long, rounded or abruptly pointed at the apex, irregularly incised-serrulate, sparingly pubescent above, at least when young, tomentulose beneath, mostly truncate or cordate at the base, short-petioled; panicles dense, the rachis and branches tomentulose and glandular; calyx 5–6 mm. wide, the lobes ovate, often broadly so, obtuse, pubescent and ciliolate; corolla 6–7 mm. long; stamens 2–2.5 mm. long, the filaments long-villous at the greatly dilated base; berries not seen.

Type collected at San Lucas, Department of Zacatepequez, Guatemala, April 1890, *J. Donnell Smith* 2190 (herb. Columbia Univ.).

DISTRIBUTION: Guatemala.

#### 9. *Arbutus peninsularis* Rose & Goldman, Contr. U. S. Nat. Herb. 13: 312. 1911.

A tree, the twigs minutely pubescent; leaves bright-green, the blades ovate to oblong or oval, 5–11 cm. long, obtuse or acute, glabrous and often shining above, pubescent, often tomentose beneath, entire or serrate, abruptly narrowed, rounded, or subcordate at the base, rather short-petioled; panicles stout, about 3 cm. long, or longer in age, the rachis and pedicels closely pubescent; calyx 6–7 mm. wide, the lobes broadly ovate to orbicular-ovate, obtuse, glabrous or merely ciliolate; corolla 6–7 mm. long; stamens 3.5–4 mm. long, the filaments short-villous at the dilated base; berries not seen.

TYPE LOCALITY: Sierra de la Laguna, Lower California.

DISTRIBUTION: Lower California.

#### 10. *Arbutus glandulosa* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 533. 1842.

*Arbutus densiflora* Benth. Pl. Hartw. 15. 1839. Not *A. densiflora* H.B.K. 1819.

*Arbutus villosa* Willd.; Klotzsch, Linnaea 24: 72. 1851.

A tree, the branchlets glandular-hirsute; leaves bright-green, the blades oblong, lanceolate, or ovate, or individually oval, 2.5–8 cm. long, acute or abruptly short-acuminate, ciliate or ciliate-serrulate, inconspicuously pubescent above, more copiously pubescent beneath, rounded or cordate at the base, long-petioled; panicles dense, 2–8 cm. long, the rachis and pedicels glandular-hirsute; calyx 5–6 mm. wide, the lobes broadly ovate or deltoid, obtuse or acutish; corolla about 8 mm. long; stamens 3–4 mm. long, the filaments villous; berries not seen.

TYPE LOCALITY: Ejutla, Oaxaca.

DISTRIBUTION: Middle and southern Mexico.

#### DOUBTFUL SPECIES

ARBUTUS ACADIENSIS L. Sp. Pl. 395. 1753. Wholly obscure.

ARBUTUS XANTHOCARPA Wangenh. Beytr. Nordam. Holz, 30. 1787.

ARBUTUS MENZIESII ELLIPTICA DC. Prodr. 7: 582. 1839. Mexico.

ARBUTUS MENZIESII OBLONGIFOLIA DC. Prodr. 7: 582. 1839. Mexico.

ARBUTUS OVATA Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 533. 1842. Mexico. Probably a *Gaultheria*.

#### 38. *COMAROSTAPHYLIS* Zucc. Abh. Akad. Münch. 2: 331. 1837.

Shrubs with erect, diffuse, or prostrate stems. Leaves alternate, persistent, usually numerous; blades narrow or sometimes broad, coriaceous, often revolute, entire or toothed, petioled. Flowers few or numerous, in terminal solitary or clustered raceme-like panicles. Calyx persistent; lobes 5, or rarely 4, much longer than the tube, spreading or reflexed at

maturity. Corolla cylindric-urceolate, ovoid-urceolate, or globular-urceolate; lobes 5, or rarely 4, broad and short, mostly recurved. Stamens 10, or rarely 8, included; filaments short, dilated near the base, unappendaged, pubescent; anthers broad, each sac with a slender awn. Ovary 5-celled, or rarely 4-celled, seated in a disk, depressed or ovoid, glabrous or pubescent; style columnar, often somewhat elongate; stigma minute, sometimes slightly dilated. Drupe globular, fleshy, the pericarp papillose or warty, the 5, or fewer by abortion, nutlets united into a round stone.

Type species, *Comarostaphylis arguta* Zucc.

Leaf-blades entire.

Filaments pubescent, sometimes sparingly so.

Ovary pubescent.

Filaments copiously pubescent; leaf-blades not densely lanate beneath.

Pedicels and rachis densely glandular-hirsutulous.

Pedicels and rachis finely, and often closely, pubescent, not glandular-hirsutulous.

Corolla glabrous.

Leaf-blades of a long and narrow type.

Inflorescence-branches and leaf-blades beneath variously pubescent, but not cinereous-canescient.

Drupe 5–6 mm. in diameter.

Leaf-blades revolute, acute or short-mucronate.

Inflorescence-branches and leaf-blades beneath sordid-pubescent or ferruginous.

Inflorescence-branches and leaf-blades beneath obscurely pale-pubescent.

Leaf-blades flat, prominently mucronate.

Drupe about 3 mm. in diameter.

Inflorescence-branches and leaf-blades beneath cinereous-canescient.

Leaf-blades of a short and broad type.

Corolla copiously pubescent.

Filaments sparingly pubescent; leaf-blades densely lanate beneath.

Ovary glabrous.

Corolla 4–5 mm. long; pedicels, rachis, and calyx finely pubescent.

Filaments sparingly villous; leaf-blades linear to linear-spatulate.

Filaments copiously villous; leaf-blades elliptic.

Corolla 6–7 mm. long; pedicels, rachis, and calyx glabrous.

Filaments glabrous.

Leaf-blades toothed.

Leaves glabrous.

Leaf-blades green beneath; calyx 3.5–4 mm. wide; drupe 4–5 mm. in diameter.

Leaf-blades glaucous beneath; calyx 6–7 mm. wide; drupe 7–8.5 mm. in diameter.

Leaves pubescent.

Ovary glabrous.

Leaf-blades of a long and narrow type.

Leaf-blades closely and conspicuously toothed; corolla pubescent.

Pedicels and rachis tomentulose; anthers globular.

Pedicels and rachis finely glandular-hirsute; anthers oblong.

Leaf-blades remotely and inconspicuously toothed; corolla glabrous.

Leaf-blades of a short and broad type.

Pedicels and rachis densely viscid-pubescent; leaf-blades singly serrate.

Calyx-lobes longer than wide; stamens 3.5–4 mm. long; dilated part of the filament not longer than wide.

Calyx-lobes about as long as wide; stamens about 2.5 mm. long; dilated part of the filament much longer than wide.

Pedicels and rachis sparingly pubescent, not viscid; leaf-blades doubly serrulate.

Ovary pubescent.

Calyx glandular-pubescent; pedicels and rachis glandular-hirsutulous.

Calyx cinereous-tomentulose; pedicels and rachis cinereous-tomentulose.

1. *C. Hartwegiana*.

2. *C. oaxacana*.

3. *C. polifolia*.

4. *C. mucronifera*.

5. *C. microcarpa*.

6. *C. mucronata*.

7. *C. Caeciliana*.

8. *C. arbutoides*.

9. *C. lanata*.

10. *C. minor*.

18. *C. glabrata*.

11. *C. costaricensis*.

12. *C. glaucescens*.

13. *C. lucida*.

14. *C. arguta*.

15. *C. rupestris*.

16. *C. longifolia*.

17. *C. angustifolia*.

18. *C. glabrata*.

19. *C. Conzattii*.

20. *C. pyrifolia*.

21. *C. nochistlanensis*.

22. *C. diversifolia*.



1. **Comarostaphylis Hartwegiana** Klotzsch, *Linnaea* 24: 77. 1851.

*Arctostaphylos Hartwegiana* Hemsl. *Biol. Centr. Am. Bot.* 2: 278. 1881.

A shrub with red-hirsutulous and glandular twigs; leaf-blades linear, usually narrowly so on account of the strongly revolute margins, 1.5–3 cm. long, acute or abruptly pointed, entire, rugose and minutely pubescent above, tomentulose beneath and with longer glandular hairs near the base, short-petioled; panicles rather closely flowered, the rachis and pedicels densely glandular-hirsutulous with reddish hairs; calyx 5–6 mm. wide, the lobes ovate or deltoid-ovate, obtuse or acutish, tomentulose; corolla about 6 mm. long; stamens 3–3.5 mm. long, the filaments villous, especially at the dilated base; drupes not seen.

TYPE LOCALITY: Bolaños, Colotlan, Jalisco.

DISTRIBUTION: Colotlan.

2. **Comarostaphylis oaxacana** (DC.) Klotzsch, *Linnaea* 24: 77.  
1851.

*Arctostaphylos oaxacana* DC. *Prodr.* 7: 585. 1839.

? *Arctostaphylos ledifolia* Mart. & Gal. *Bull. Acad. Brux.* 91: 536. 1842.

? *Arctostaphylos latifolia* Mart. & Gal.; Walp. *Rep.* 2: 726. 1843.

? *Comarostaphylis latifolia* Klotzsch, *Linnaea* 24: 76. 1851.

A shrub with reddish-velutinous twigs; leaf-blades narrowly oblong or linear-oblong, varying to slightly broadest above or below the middle, thick, 1.5–3 cm. long, acute or mucronate, glabrous or with scattered hairs above, more or less densely velutinous or puberulent beneath, entire, short-petioled; panicles rather closely flowered, the rachis and pedicels velutinous or somewhat tomentulose; calyx 4–5 mm. wide, the lobes ovate, often broadly so, or reniform-ovate, ciliolate or velutinous all over, acute or acutish; corolla 7–8 mm. long; stamens about 3 mm. long, the filaments villous; ovary pubescent; drupes 5–6 mm. in diameter.

TYPE LOCALITY: Oaxaca.

DISTRIBUTION: Southern Mexico.

ILLUSTRATION: Hook.  *Ic. Pl. pl.* 27 (as *Arbutus xalapensis*).

3. **Comarostaphylis polifolia** (H. B. K.) Zucc.; Klotzsch, *Linnaea*  
24: 77. 1851.

*Arctostaphylos polifolia* H. B. K. *Nov. Gen. & Sp.* 3: 277. 1819.

A shrub with glabrous, or sparingly pubescent or puberulent twigs; leaf-blades linear, varying to slightly broadest above or below the middle, thick, 2–4.5 cm. long, acute or slightly spinescent at the apex, glabrous, at least ultimately so, and often shining above, pale and glabrous beneath, or with persistent scattered hairs, or puberulent, entire, revolute, short-petioled; panicles rather loosely flowered, the rachis and pedicels glabrous or with scattered hairs; calyx 5–5.5 mm. wide, the lobes ovate, usually broadly so, acute or acutish, glabrous or merely ciliolate; corolla 8–9 mm. long; stamens about 3 mm. long, the filaments villous; ovary pubescent; drupes 5–6 mm. in diameter.

TYPE LOCALITY: Near Villalpando, Mexico.

DISTRIBUTION: Middle and southern Mexico.

ILLUSTRATION: H. B. K. *Nov. Gen. & Sp. pl.* 258.

4. **Comarostaphylis mucronifera** (DC.) Klotzsch, *Linnaea* 24: 76.  
1851.

*Arctostaphylos mucronifera* DC. *Prodr.* 7: 585. 1839.

A shrub with softly fine-pubescent twigs; leaf-blades linear-oblong or linear-oblongate, or oblanceolate, 3–7 cm. long, thinnish, abruptly or gradually prominently mucronate, glabrous above, at least ultimately so, and somewhat shining, more or less soft-pubescent about the veins beneath, entire, not revolute, short-petioled; panicles rather loosely flowered, the rachis and pedicels finely, usually sparingly, pubescent, and usually somewhat glandular; calyx about 5 mm. wide, the lobes ovate, often narrowly so, acute, tomentulose; corolla 7–8 mm. long; stamens about 3 mm. long, the filaments villous; ovary pubescent; drupes 5–6 mm. in diameter.

TYPE LOCALITY: Cordillera de Guachilagua, Mexico.

DISTRIBUTION: Middle and southern Mexico.

### 5. *Comarostaphylis microcarpa* Small, sp. nov.

A shrub with minutely tomentulose twigs; leaf-blades linear to linear-oblong, 3–7 cm. long, acute or mucronulate, entire, thickish, slightly revolute, glabrous, minutely reticulate and somewhat shining above, minutely tomentulose and reticulate beneath, short-petioled; panicles loosely flowered, the rachis and pedicels minutely glandular-pubescent; calyx 3–4 mm. wide, the lobes ovate, abruptly pointed, obscurely ciliate; corolla not seen; drupes globular or somewhat depressed, about 3 mm. in diameter.

Type collected in the Sierra Madre, Territorio de Tepic, Mexico, August 13, 1897, *J. N. Rose* 3466 (U. S. Nat. Herb.).

DISTRIBUTION: Tepic.

### 6. *Comarostaphylis mucronata* Klotzsch, *Linnaea* 24: 76. 1851.

*Comarostaphylis mucronata brevifolia* Klotzsch, *Linnaea* 24: 76. 1851.

*Comarostaphylis mucronata angustata* Klotzsch, *Linnaea* 24: 76. 1851.

*Arctostaphylos mucronata* Hemsl. *Biol. Centr. Am. Bot.* 2: 279. 1881.

A shrub with cinereous-canescens twigs; leaf-blades oblong, often narrowly so, 3–8.5 cm. long, thinnish, mucronate, deep-green and minutely pubescent above, cinereous-canescens beneath, entire or merely undulate, short-petioled; panicles rather loosely flowered, the rachis and pedicels cinereous-canescens; calyx 4–4.5 mm. wide, the lobes ovate to deltoid-ovate, acute or abruptly pointed, finely pubescent; corolla 6–7 mm. long; stamens about 2.5 mm. long, the filaments villous; drupes 2–3 mm. in diameter.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Mexico.

### 7. *Comarostaphylis Caeciliana* (Loesener) Small.

*Arctostaphylos Caeciliana* Loesener, *Bull. Herb. Boiss.* 2: 553. 1894.

A shrub with tomentulose twigs; leaf-blades broadly lanceolate to oblong, sometimes oval, 3–6 cm. long, obtuse or abruptly sharp-pointed, entire, thickish, somewhat revolute and undulate, glabrous above, more or less tomentulose-lanate beneath, short-petioled; panicles rather loosely flowered, the rachis and pedicels glandular-pubescent; calyx 4–4.5 mm. wide, the lobes ovate, acute or acutish, ciliate; corolla about 5 mm. long; stamens about 3 mm. long, the filaments villous; drupes globular, 4–5 mm. in diameter.

TYPE LOCALITY: Near Huitzo, Oaxaca.

DISTRIBUTION: Oaxaca.

ILLUSTRATION: *Bull. Herb. Boiss.* 2: *pl.* 20, *f.* 14.

### 8. *Comarostaphylis arbutoides* Lindl. *Bot. Reg.* 29: *pl.* 30. 1843.

*Arctostaphylos arbutoides* Hemsl. *Biol. Centr. Am. Bot.* 2: 278. 1881.

A shrub with finely reddish-tomentulose twigs; leaf-blades oblong or elliptic, or sometimes broadest above the middle, 5–9 cm. long, thick, acute or mucronate, glabrous above, at least in age, thinly reddish-tomentulose beneath, gradually or abruptly narrowed at the base, short-petioled; panicles loosely flowered, the rachis and pedicels red-tomentulose; calyx 4–5 mm. wide, the lobes triangular-ovate to triangular-lanceolate, acute or slightly acuminate, finely tomentulose; corolla 6–7 mm. long; stamens about 3 mm. long, the filaments copiously villous; drupes not seen.

TYPE LOCALITY: Quezaltenango, Guatemala, grown from seeds in garden of Horticultural Society, London.

DISTRIBUTION: Guatemala and Panama.

ILLUSTRATION: *Bot. Reg.* 29: *pl.* 30.

### 9. *Comarostaphylis lanata* Small, sp. nov.

A shrub with densely glandular-hirsutulous twigs; leaf-blades oblong or elliptic, sometimes rather narrowly so, especially on account of the revolute margins, 4–6.5 cm. long, acute or mucronate, entire, thickish, sparingly fine-pubescent, light-green, and somewhat shining above, densely lanate and pale beneath, short-petioled; panicles closely flowered, the rachis and pedicels glandular-hirsutulous; calyx 5.5–6.5 mm. wide, the lobes ovate to oblong-ovate, acute, ciliate; corolla about 6 mm. long, glabrous or nearly so; stamens about 3 mm. long, the



filaments sparingly pubescent near the slightly dilated base; drupes globular, 4–5 mm. in diameter.

Type collected at Buena Vista, San Luis Potosi, Mexico, May, 1911, *C. A. Purpus 4936* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: San Luis Potosi.

#### 10. *Comarostaphylis minor* Small, sp. nov.

A shrub with glabrous or nearly glabrous twigs; leaf-blades linear to linear-spatulate, 1.5–2.5 cm. long, obtuse or acutish, thinnish, glabrous, or merely puberulent beneath when young, entire, flat, shining above, paler and dull beneath, short-petioled; panicles closely flowered, the rachis and pedicels minutely pale-pubescent; calyx 3–3.5 mm. wide, the lobes deltoid to triangular-lanceolate, acute or acutish, ciliolate; corolla 4–5 mm. long; stamens 2.5–3 mm. long, the filaments sparingly villous above the dilated base; drupes spheroidal, 3–4 mm. in diameter.

Type collected near Miguihuana, Tamaulipas, Mexico, June 10, 1898, *E. W. Nelson 4469* (U. S. Nat. Herb.).

DISTRIBUTION: Tamaulipas.

#### 11. *Comarostaphylis costaricensis* Small, sp. nov.

A shrub with glabrous twigs; leaf-blades narrowly oblong or narrowly elliptic, or sometimes oblong-spatulate, 3–7 cm. long, acute or abruptly short-acuminate, thickish, glabrous, entire, slightly revolute, smooth and somewhat shining above, pale-green or glaucous beneath, short-petioled; panicles rather closely flowered, the rachis and pedicels glabrous or with scattered hairs; calyx 4.5–5 mm. wide, the lobes ovate to triangular-lanceolate, acuminate, erose; corolla 6–7 mm. long; stamens 2.5–3 mm. long, the filaments sparingly villous near the dilated base; drupes globose-ovoid, 4–5 mm. in diameter.

Type collected on Irazu, Costa Rica, June 25, 1874, *O. Kuntze 2361* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Costa Rica.

#### 12. *Comarostaphylis glaucescens* (H. B. K.) Zucc.; Klotzsch, *Linnaea* 24: 76. 1851.

*Arctostaphylos glaucescens* H. B. K. Nov. Gen. & Sp. 3: 278. 1819.

A shrub with puberulent twigs; leaf-blades oblong-lanceolate, 10 cm. long or less, somewhat mucronate, thickish, entire, glabrous and shining above, somewhat reticulate, pubescent and glaucous beneath, short-petioled; panicle closely flowered, the rachis and pedicels puberulent; calyx purple, the lobes orbicular-ovate, acute, glandular-ciliate; corolla glabrous; stamens one half as long as the corolla, the filaments glabrous; ovary pubescent; drupe depressed-globose.\*

TYPE LOCALITY: Between Guanajuato and Valenciana, Guanajuato.

DISTRIBUTION: Known only from the type locality.

#### 13. *Comarostaphylis lucida* Small, sp. nov.

A shrub with glabrous twigs; leaf-blades narrowly oblong or narrowly elliptic, or oblong-spatulate, 3–7 cm. long, acute, glabrous, smooth and somewhat shining above, dull and scarcely paler beneath, prominently serrulate, short-petioled; panicles rather closely flowered, the rachis and pedicels minutely pubescent; calyx 3.5–4 mm. wide, the lobes deltoid to ovate-deltoid, acute or acuminate, ciliolate; corolla not seen; drupes spheroidal, 4–5 mm. in diameter.

Type collected at Orizaba, Mexico, in 1855, *F. Müller (191) 1503*.

DISTRIBUTION: Orizaba; Oaxaca.

#### 14. *Comarostaphylis arguta* Zucc. Abh. Akad. Münch. 2: 332. 1837.

*Arbutus discolor* Hook. Ic. pl. 29. 1837.

*Arctostaphylos arguta* DC. Prodr. 7: 585. 1839.

*Arctostaphylos discolor* DC. Prodr. 7: 585. 1839.

*Arctostaphylos nitida* Benth. Pl. Hartw. 66. 1840.

*Arctostaphylos spinulosa* Mart. & Gal. Bull. Acad. Brux. 9<sup>1</sup>: 537. 1842.

\* Description adapted from the original. If the character given for the filaments, *i. e.* glabrous, is correct, this alone distinguishes it from all of our other species with entire leaf-blades.

A shrub with glabrous twigs; leaf-blades narrowly oblong, elongate-elliptic, or oblong-lanceolate, 6–15 cm. long, acute or short-acuminate, sharply dentate or dentate-serrate, glabrous, bright-green and often shining above, pale or glaucous beneath, short-petioled; panicles rather closely flowered, the rachis and pedicels sparingly fine-pubescent or glabrous in age; calyx 6–7 mm. wide, the lobes ovate-lanceolate, acuminate, ciliolate; corolla 7–8 mm. long; stamens about 3 mm. long, the filaments glabrous; drupes 7–8.5 mm. in diameter.

TYPE LOCALITY: Plants raised from seeds collected in southern Mexico by Karwinski.

DISTRIBUTION: Southern Mexico.

ILLUSTRATIONS: Hook. Ic. Pl. *pl.* 29; Bot. Reg. 31: *pl.* 32.

### 15. *Comarostaphylis rupestris* (Rob. & Seaton) Small.

*Arctostaphylos rupestris* Rob. & Seaton, Proc. Am. Acad. 28: 112. 1893.

A shrub with tomentulose twigs; leaf-blades oblong, rather narrowly so, to oblong-oblong-olate, 7–16 cm. long, acute or short-acuminate, serrulate with cartilaginous-tipped teeth, finely pubescent above, at least when young, tomentulose beneath, short-petioled; panicles rather loosely flowered, the rachis and pedicels tomentulose; calyx 4–5 mm. wide, the lobes deltoid to reniform, acute or sometimes abruptly pointed, ciliolate; corolla 6–7 mm. long; stamens about 3 mm. long, the filaments villous-hirsute; drupes not seen.

TYPE LOCALITY: Near Patzcuaro, Michoacan.

DISTRIBUTION: Michoacan.

### 16. *Comarostaphylis longifolia* (Benth.) Klotzsch, Linnaea 24: 75. 1851.

*Arctostaphylos longifolia* Benth. Pl. Hartw. 44. 1840.

*Comarostaphylis attenuata* Klotzsch, Linnaea 24: 75. 1851.

*Arctostaphylos attenuata* Hemsl. Biol. Centr. Am. Bot. 2: 278. 1881.

A shrub with glandular-hirsute twigs; leaf-blades oblong, sometimes narrowly oblong or linear-oblong, or slightly oblong-lanceolate, 4–9.5 cm. long, acute or slightly acuminate, finely pubescent above, at least when young, tomentulose beneath, finely serrate-dentate with mucronate teeth, short-petioled; panicles rather closely flowered, the rachis and pedicels finely glandular-hirsute; calyx 4.5–5.5 mm. wide, the lobes lanceolate to ovate-lanceolate, acuminate, glandular-pubescent; corolla 6–7 mm. long; stamens about 3 mm. long, the filaments villous; drupes not seen.

TYPE LOCALITY: Anganguero, Michoacan.

DISTRIBUTION: Central and southern Mexico.

### 17. *Comarostaphylis angustifolia* Klotzsch, Linnaea 24: 74. 1851.

*Arctostaphylos angustifolia* Hemsl. Biol. Centr. Am. Bot. 2: 278. 1881.

A shrub with puberulent and finely pubescent twigs; leaf-blades narrowly oblong to broadly linear, 3–6 cm. long, more or less attenuate at both ends, remotely serrate, somewhat revolute, bright-green and glabrous above, pale and ultimately glabrous beneath except the midrib and veins, short-petioled; panicles loosely flowered, the rachis and pedicels glandular-pilose; calyx about 5 mm. wide, the lobes ovate, acute or acutish, sparingly pubescent and ciliolate; corolla 6–7 mm. long; stamens about 3 mm. long, the filaments villous; drupes globular, 5–6 mm. in diameter.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Middle and southern Mexico.

### 18. *Comarostaphylis glabrata* (Fernald) Small.

*Arctostaphylos glabrata* Fernald, Proc. Am. Acad. 36: 497. 1901.

A shrub with minutely pubescent or puberulent twigs; leaf-blades elliptic, 2–4 cm. long, acute or obtuse, entire or sharply toothed, bright-green and somewhat shining above, sparingly tomentulose beneath when young, glabrate in age, short-petioled; panicles closely flowered, the rachis and pedicels reddish-tomentulose; calyx 4–5 mm. wide, the lobes deltoid-



ovate, orbicular-ovate, or deltoid, obtuse, slightly tomentulose, ciliolate; corolla 4–5 mm. long; stamens 3.5–4 mm. long, the filaments villous above the dilated base; ovary glabrous; drupes globular, 6–7 mm. in diameter.

TYPE LOCALITY: Summit of Sierra de San Felipe, Oaxaca.

DISTRIBUTION: Oaxaca.

### 19. *Comarostaphylis Konzattii* (Fernald) Small.

*Arctostaphylos Konzattii* Fernald, Proc. Am. Acad. 36: 497. 1901.

A shrub with puberulent twigs; leaf-blades oblong to oval, or slightly broadened upward, 2.5–6 cm. long, acute or obtuse, singly serrate, especially above the middle, pubescent when young, glabrous above and often slightly shining in age, more or less pubescent beneath, short-petioled; panicles raceme-like, simple or compound, rather closely flowered, the rachis and pedicels finely pubescent; calyx 4.5–5 mm. wide, the lobes ovate or triangular-ovate, ciliate; corolla 4–6 mm. long; stamens 2.5 mm. long, the filaments villous; ovary pubescent; drupes 6–7 mm. in diameter.

TYPE LOCALITY: Sierra de San Felipe, Oaxaca.

DISTRIBUTION: Oaxaca.

### 20. *Comarostaphylis pyrifolia* (Donn. Smith) Small, sp. nov.

*Arctostaphylos arguta pyrifolia* Donn. Smith; Loesener, Bull. Herb. Boiss. II. 3: 219. 1903.

A shrub with glabrous twigs; leaf-blades oval, varying to ovate or obovate, 2.5–5 cm. long, acute or rounded and abruptly pointed at the apex, doubly serrulate, glabrous above, sparingly pubescent on the veins beneath, or ultimately glabrous, short-petioled; panicles loosely flowered, the rachis and pedicels with scattered hairs or glabrous; calyx 4.5–5.5 mm. wide, the lobes deltoid to ovate-deltoid, finely pubescent and ciliate, acute; corolla about 5 mm. long; stamens 2.5–3 mm. long, the filaments villous at the much dilated base; drupes not seen.

TYPE LOCALITY: Near Todos los Santos, Guatemala.

DISTRIBUTION: Guatemala.

### 21. *Comarostaphylis nochistlanensis* (Loesener) Small.

*Arctostaphylos nochistlanensis* Loesener, Bull. Herb. Boiss. II. 3: 220. 1903.

A shrub with finely pubescent twigs; leaf-blades oblong, often narrowly so, oblong-lanceolate or lanceolate, 3–5.5 cm. long, obtuse or mucronate, serrulate, glabrous above, at least at maturity, and somewhat shining, pale and minutely pubescent beneath, short-petioled; panicles closely flowered, the rachis and pedicels closely glandular-hirsutulous; calyx about 5 mm. wide, the lobes triangular-ovate to triangular-lanceolate, acuminate, glandular-pubescent, ciliate; corolla about 6 mm. long; stamens 2.5–3 mm. long, the filaments villous; drupes globular, 4–5 mm. in diameter.

TYPE LOCALITY: Near Tillantongo, Nochistlan, Oaxaca.

DISTRIBUTION: Oaxaca.

### 22. *Comarostaphylis diversifolia* (Parry) Greene, Bull. Calif. Acad. 2: 406. 1887.

*Arctostaphylos arguta diversifolia* Parry, Proc. Davenport Acad. 4: 35. 1884.

*Arctostaphylos diversifolia* Parry; A. Gray, Syn. Fl. N. Am. ed. 2. 2<sup>1</sup>: 397. 1886.

A shrub with canescent-tomentulose twigs; leaf-blades elliptic or oval, varying to slightly broadest above or below the middle, 2–9 cm. long, obtuse or acutish, obscurely serrate-dentate, more or less revolute, finely reticulate, ultimately glabrous and somewhat shining above, cinereous-tomentulose beneath, short-petioled; panicles loosely flowered, the rachis and pedicels cinereous-tomentulose; calyx 6.5–8 mm. wide, the lobes lanceolate, acuminate, cinereous-tomentulose; corolla 5–7 mm. long; stamens 2.5–3.5 mm. long, the filaments villous below the middle; ovary pubescent; drupes globular, about 4 mm. in diameter.

TYPE LOCALITY: Jamul Valley, southern California.

DISTRIBUTION: Southern California and adjacent Lower California, and islands off the coast of southern California.

### 39. XYLOCOCCUS Nutt. Trans. Am. Phil. Soc. II. 8: 358. 1843.

Shrubs with erect densely branched stems. Leaves alternate, persistent; blades broad, entire, revolute, short-petioled. Flowers few in terminal unbranched panicles with stout rachis and pedicels, the bracts scale-like. Calyx persistent; lobes 5, or rarely 4, very broad, much longer than the tube, reflexed at maturity. Corolla oblong-urceolate; lobes 5, or rarely 4, very small, spreading or recurved. Stamens 10, or rarely 8, included; filaments elongate, dilated near the base, unappendaged, pubescent; anthers broad, oval or ovoid, each sac with a slender awn. Ovary ovoid, 5-celled or rarely 4-celled, seated in a disk, pubescent; style elongate; stigma minute. Drupe dry, with a smooth pericarp and a thin pulp, the woody nutlets united into a solid stone.

Type species, *Xylococcus bicolor* Nutt.

#### 1. *Xylococcus bicolor* Nutt. Trans. Am. Phil. Soc. II. 8: 259. 1843.

*Comarostaphylis bicolor* Klotzsch, Linnaea 24: 78. 1851.

*Arctostaphylos Veatchii* Kellogg, Proc. Calif. Acad. 2: 19. 1863.

*Arctostaphylos bicolor* A. Gray, Proc. Am. Acad. 7: 366. 1868.

*Arctostaphylos Clevelandi* A. Gray, Syn. Fl. N. Am. 2<sup>1</sup>: 29. 1878.

A shrub densely branched above, with cinereous-tomentulose twigs; leaf-blades ovate or oval, often apparently narrowly so on account of the revolute margins, obtuse or acutish, 2–6 cm. long, entire, ultimately veiny and glabrous or nearly so above, more or less tomentose beneath, narrowed or rounded at the base, short-petioled; panicles short, recurved, densely few-flowered, the rachis and pedicels tomentulose; calyx about 5 mm. wide, the lobes reniform or ovate-reniform, obtuse, tomentulose; corolla 8–9 mm. long, white or pink, sometimes rose-colored, the lobes minute; stamens 5–6 mm. long, the filaments very slender above the dilated base, villous, the anthers nearly 2 mm. long; drupes globular, 6–8 mm. in diameter, often purplish-red.

TYPE LOCALITY: Monterey, California; but probably San Diego, as the plant is not found in the Monterey region.

DISTRIBUTION: Southern California and northern Lower California.

### 40. UVA-URSI\* (Tourn.) Mill. Gard. Dict. Abr. ed. 4. 1754.

*Arctostaphylos* Adans. Fam. Pl. 2: 165. 1763.

*Mairania* Neck. Elem. 1: 219. 1790.

*Xerobotrys* Nutt. Trans. Am. Phil. Soc. II. 8: 267. 1843.

*Daphnidostaphylis* Klotzsch, Linnaea 24: 79. 1851.

Low spreading or erect shrubs or small trees, with exfoliating bark, on trunks and old branches often polished and reddish-brown. Leaves alternate, petioled or sessile, firm or coriaceous, evergreen, often similar on both surfaces and vertical by a twist of the petiole. Flowers in terminal racemes or panicles, small, nodding on slender pedicels bracteolate at base, and borne in the axils of persistent or deciduous bracts. Calyx 5-parted, the oblong to orbicular lobes persistent. Corolla urceolate to oblong-campanulate, 5-lobed, the lobes short, rounded, recurved, imbricate in the bud. Stamens 10, included; filaments dilated and usually hairy at base; anthers erect, short, introrse, with 2 recurved dorsal awns; pollen-sacs opening by a terminal pore. Disk 10-lobed. Ovary 4–10-celled; ovules solitary in the cavities; style slender. Drupe with 4–10 seed-like nutlets, irregularly separable or united into a solid stone; pericarp thin or often with a granular pulp.

Type species, *Arbutus Uva-ursi* L.

Pericarp with a granular pulp; nutlets separate, irregularly coalescent or rarely united into a solid stone.

Leaf-blades rounded at apex, not mucronate; fruit bright-red and insipid.

Leaf-blades acute to rounded and mucronate or mucronulate at apex; fruit reddish-brown to yellowish-brown, acid.

Fruit depressed-globose, globose, or rarely ovoid, with copious granular pulp.

Pedicels and ovaries glabrous; leaves dull- or bright-green; branchlets never setose-hispid.

Low alpine shrubs with prostrate or decumbent branches; leaf-blades less than 15 mm. broad.

1. *U. Uva-ursi*.

\*By LEROY ABRAMS.



- Branches decumbent, not rooting; leaf-blades prominently mucronate.
- Branches prostrate, more or less rooting; leaf-blades obscurely mucronate.
- Erect bushy or more or less arborescent shrubs, sometimes depressed in no. 4.
- Flowers 4–5 mm. long; fruit 3–4 mm. broad; low sometimes depressed maritime shrub.
- Flowers mostly 6–7 mm. long; fruit 6–8 mm. broad; shrubs, mostly 1–4 m. high.
- Leaf-blades seldom more than 15 mm. broad; inflorescence of short simple or few-branched racemes.
- Calyx-lobes ovate, pubescent on the margins; bracts brown and nearly glabrous above the middle.
- Calyx-lobes rounded, glabrous; bracts tomentose throughout.
- Leaf-blades mostly more than 20 mm. broad and 25 mm. or more in length; flowers commonly in ample panicles.
- Flower-bearing part of the rachis thickened; bracts triangular to lanceolate, acute or acuminate, 3 mm. or more in length.
- Fruit ovoid; nutlets united into a solid, 5-celled, ellipsoid stone, prominently ribbed and rugosely roughened.
- Fruit depressed-globose; nutlets irregularly separable.
- Leaves dull-green with a bloom; inflorescence usually tomentose; nutlets carinate on the back, prominently rugosely roughened.
- Leaves bright yellowish-green and shining, without bloom; inflorescence resinous-glandular or glandular-pubescent; nutlets inconspicuously ribbed, otherwise nearly smooth.
- Flower-bearing part of the rachis elongate, not thickened; bracts scattered, subulate, 2 mm. or less in length; leaves bright-green and shining.
- Pedicels and ovaries variously pubescent or sometimes one or the other glabrous; leaves often pale grayish-green; branchlets often setose-hispid.
- Erect shrubs, 1 m. or more high; leaf-blades mostly more than 25 mm. long; flowers 6–7 mm. long.
- Bracts firm and persistent, at least the lower often foliaceous; calyx-lobes ovate to orbicular, more or less ciliate on the margins, otherwise nearly or quite glabrous.
- Pedicels in fruit stout, usually less than 1 cm. long.
- Leaf-blades petioled.
- Leaf-blades glabrous, bright-green and shining; branchlets glabrous or sparsely glandular-pubescent.
- Leaf-blades more or less tomentose, at least on the lower surface; branchlets more or less tomentose and often glandular or setose-hispid.
- Bark early exfoliating, on the old branches and trunks very smooth.
- Bark tardily exfoliating, on the old branches and trunks shreddy.
- Leaf-blades sessile or nearly so, and clasping at base.
- Pedicels glandular-villous.
- Branchlets and inflorescence densely glandular-villous.
- Branchlets and inflorescence tomentose and with a few setose-hispid hairs.
- Pedicels glabrous; leaves pale, more or less tomentose.
- Pedicels in fruit very slender, 15–25 mm. long, glandular-villous; leaves very pale.
- Herbage glabrous and glaucous.
- Herbage glandular-pubescent or glandular-villous.
- Bracts membranous and deciduous; calyx-lobes oblong-lanceolate, villous; herbage glandular-villous.
- Nutlets separable.
- Nutlets united into a solid stone.
- Low spreading shrub forming mats; leaf-blades narrowly obovate to spatulate, less than 25 mm. long; flowers 4–5 mm. long.
- Fruit laterally compressed, small, with scant granular pulp; flowers 4 mm. long; low shrubs; leaf-blades less than 25 mm. long.
- Leaf-blades cartilaginous and revolute on the margins.
2. *U. nevadensis*.
3. *U. cratericola*.
4. *U. Hookeri*.
5. *U. montana*.
6. *U. pungens*.
7. *U. Parryana*.
8. *U. Manzanita*.
9. *U. patula*.
10. *U. Stanfordiana*.
11. *U. insularis*.
12. *U. tomentosa*.
13. *U. vestita*.
14. *U. Andersonii*.
15. *U. auriculata*.
16. *U. pechoensis*.
17. *U. viscida*.
18. *U. Mariposa*.
19. *U. Pringlei*.
20. *U. drupacea*.
21. *U. pumila*.
22. *U. nummularia*.

Leaf-blades not revolute on the margins.  
Pericarp thin, very clammy on the surface, without granular pulp; nutlets united into a rounded or ovoid longitudinally striate stone.

23. *U. myrtifolia*.

24. *U. glauca*.

1. *Uva-ursi* *Uva-ursi* (L.) Britton; Britt. & Brown, Ill. Fl. ed. 2.  
2: 693. 1913.

*Arbutus Uva-ursi* L. Sp. Pl. 395. 1753.

*Uva-ursi procumbens* Moench, Meth. 470. 1794.

*Mairania Uva-ursi* Desv. Jour. Bot. Desv. II. 1: 37. 1813.

*Uva-ursi buxifolia* S. F. Gray, Nat. Arr. Brit. Pl. 2: 400. 1821.

*Arctostaphylos Uva-ursi* Spreng. Syst. 2: 287. 1825.

*Arctostaphylos officinalis* Wimm. & Grab. Fl. Siles. 1: 391. 1827.

*Arctostaphylos procumbens* Patze, Meyer & Elkan, Fl. Preuss. 188. 1850.

*Daphnidostaphylis Fendleriana* Klotzsch, Linnaea 24: 80. 1851.

*Arctostaphylos Uva-ursi alba* Cockerell, W. Am. Sci. 6: 11. 1889.

A low prostrate shrub, with rooting branches 2–5 dm. long, tardily exfoliating, reddish-brown bark, and glabrous or sparsely tomentose branchlets; leaf-blades spatulate to obovate, 15–20 mm. long, rounded or emarginate at apex, not at all mucronate, tapering at the base, thin-coriaceous, bright-green and glabrous above, paler beneath, the margins thin and more or less revolute; petioles 2–3 mm. long; flowers in short, few-flowered racemes; rachis sparsely tomentose; bracts triangular, acute, 2 mm. long, persistent, nearly or quite glabrous; pedicels slender, 3–4 mm. long, glabrous; calyx-lobes broadly ovate, glabrous or rarely sparsely pubescent on the margins; corolla 4–6 mm. long, white or tinged with pink; ovary glabrous; fruit globose, bright-red, with a bitter astringent pulp; nutlets separable, rounded on the back and 1-nerved.

TYPE LOCALITY: Northern Europe.

DISTRIBUTION: Arctic America, from Labrador to Alaska, and southward to Virginia, Illinois, New Mexico, and the northern boundary of California; also in Europe and Asia.

ILLUSTRATIONS: A. Dietr. Fl. Bor. pl. 349; Baxter, Brit. Bot. pl. 502; Britt. & Brown, Ill. Fl. f. 2776; ed. 2. f. 3249; Meehan, Nat. Fl. 1: pl. 20; Mathews, Field Book 329.

2. *Uva-ursi nevadensis* (A. Gray) Abrams.

*Arctostaphylos nevadensis* A. Gray, Syn. Fl. N. Am. 2: 27. 1878.

A low depressed shrub, forming mats, with decumbent branches 3–6 dm. long, exfoliating, reddish-brown bark, and more or less tomentose branchlets; leaf-blades ovate to oblanceolate, commonly narrowly obovate, 15–25 mm. long, rounded to acutish at the apex, prominently mucronate, coriaceous, bright-green on both surfaces, glabrous or sparsely puberulent; petioles 3–5 mm. long, puberulent or glabrous; flowers in very short, simple or few-branched racemes; bracts firm, abruptly acuminate above the base, 3 mm. long, pubescent; pedicels slender, 4–5 mm. long, glabrous or rarely sparsely puberulent; calyx-lobes broadly ovate, glabrous, or short-ciliate on the margins; corolla 7–8 mm. long; ovary glabrous; fruit deep-brown, depressed-globose, with copious acid pulp; nutlets readily separable, rugosely roughened.

TYPE LOCALITY: Sierra Nevada, California, at elevations of 2650 to 3340 meters.

DISTRIBUTION: A subalpine species of the Cascade Mountains and the Sierra Nevada, from Washington to California.

3. *Uva-ursi cratericola* (Donn. Smith) Abrams.

*Arctostaphylos pungens cratericola* Donn. Smith, Bot. Gaz. 16: 13. 1891.

*Arctostaphylos cratericola* Donn. Smith, Bot. Gaz. 55: 437. 1913.

A prostrate shrub, with more or less rooting branches, tardily exfoliating roughened bark, and sparsely puberulent branchlets; leaf-blades broadly obovate to oblanceolate, 12–18 mm. long, 10 mm. or less wide, firm-coriaceous, bright-green and shining on both surfaces, sparsely tomentose toward the base, obtuse or acute, pungently pointed; petioles flattened, 2–3 mm. long; flowers in very short subcapitate racemes; bracts triangular, acutish, 3 mm. long, puberulent; pedicels scarcely equaling the bracts in flower, glabrous; calyx-lobes rounded, densely short-ciliate on the margins; ovary glabrous; fruit unknown.

TYPE LOCALITY: On rocks in the crater of Volcan de Agua, Guatemala.

DISTRIBUTION: Known only from the type locality.



4. *Uva-ursi Hookeri* (G. Don) Abrams.

*Arctostaphylos Hookeri* G. Don, Gen. Hist. 3: 836. 1834.  
*Andromeda venulosa* DC. Prodr. 7: 607. 1839.  
*Arctostaphylos acuta* Nutt. Trans. Am. Phil. Soc. II. 8: 267. 1843.  
*Xerobotrys venulosa* Nutt. Trans. Am. Phil. Soc. II. 8: 268. 1843.  
*Daphnidostaphylis Hookeri* Klotzsch, Linnaea 24: 80. 1851.  
*Daphnidostaphylis acuta* Klotzsch, Linnaea 24: 81. 1851.  
*Arctostaphylos franciscana* Eastw. Bull. Torrey Club 32: 201. 1905.

A low, erect, bushy shrub, branching from the base, with smooth very dark reddish-brown bark and somewhat tomentose branchlets; leaf-blades ovate to obovate, 12–25 mm. long, bright-green or slightly cinereous when young, prominently reticulate-veined; petioles slender, 3–5 mm. long; flowers in short subcapitate racemes; rachis tomentose; bracts triangular, 2 mm. long, tomentose; pedicels 3–4 mm. long, glabrous; calyx-lobes ovate, pubescent on the margins; corolla pink, 4–5 mm. long; ovary glabrous; fruit slightly depressed-globose, chestnut-brown, 4–5 mm. broad; nutlets irregularly coalescent, 3 mm. long, rounded on the back, ribbed and rugosely roughened.

TYPE LOCALITY: Monterey, California.

DISTRIBUTION: Near the coast from San Francisco to San Simeon Bay, San Luis Obispo County, California.

5. *Uva-ursi montana* (Eastw.) Abrams.

*Arctostaphylos montana* Eastw. Proc. Calif. Acad. III. 1: 83. 1897.

A low spreading shrub, 1 m. or less high, with nearly smooth reddish-brown bark and hoary tomentose branchlets; leaf-blades ovate, obovate, or broadly elliptic, 15–25 mm. long, obtuse or acutish and prominently apiculate at the apex, coriaceous, dull-green and more or less tomentose; petioles 3–4 mm. long, tomentose; flowers in short spike-like simple or few-branched racemes; rachis densely tomentose; bracts triangular, 3 mm. long, tomentose below the middle, the upper half nearly or quite glabrous, brown and deciduous; pedicels 4–5 mm. long, glabrous; calyx-lobes ovate, pubescent on the margins; corolla 6–7 mm. long; ovary conic, glabrous; nutlets irregularly coalescent, rounded on the back and faintly ribbed, otherwise nearly smooth.

TYPE LOCALITY: Mt. Tamalpais, Marin County, California.

DISTRIBUTION: Coast ranges of central California.

6. *Uva-ursi pungens* (H. B. K.) Abrams, Bull. N. Y. Bot. Gard.  
6: 432. 1910.

*Arctostaphylos pungens* H. B. K. Nov. Gen. & Sp. 3: 278. 1819.  
*Arbutus myrtifolia* Willd.; Steud. Nom. Bot. ed. 2. 1: 119, 120, as a synonym. 1840.  
*Arbutus rigida* Willd.; Steud. Nom. Bot. ed. 2. 1: 119, 120, as a synonym. 1840.  
*Daphnidostaphylis pungens* Klotzsch, Linnaea 24: 80. 1851.

An erect shrub, branching from the base, 1–3 m. high, with smooth reddish-brown bark and branchlets more or less cinereous with a fine tomentum; leaf-blades ovate to lanceolate or obovate to oblanceolate, 15–30 mm. long, usually less than 15 mm. wide, minutely grayish-tomentose when young, becoming dull-green or more or less shining; flowers in short spike-like racemes, the racemes simple or with 1 or 2 short branches; bracts triangular, 3 mm. long, tomentose throughout; pedicels 5–7 mm. long, glabrous; calyx-lobes rounded, 1.5 mm. long, glabrous; corolla 7 mm. long; ovary glabrous; fruit depressed-globose, 5–8 mm. broad, smooth, chestnut-brown; nutlets separable or irregularly coalescent, carinate and prominently corrugately wrinkled.

TYPE LOCALITY: On mountain slopes near the city of Mexico.

DISTRIBUTION: Utah and the San Bernardino Mountains of southern California, and southward through the Mexican Plateau region to Oaxaca.

ILLUSTRATIONS: H. B. K. Nov. Gen. & Sp. *pl.* 259; Bot. Reg. 30: *pl.* 17; Bot. Mag. *pl.* 3927; Torr. in Emory, Notes Mil. Rec. *pl.* 7.

7. *Uva-ursi Parryana* (Lemmon) Abrams, Bull. N. Y. Bot. Gard.  
6: 432. 1910.

*Arctostaphylos Parryana* Lemmon, Pittonia 2: 68. 1890.

An erect branching shrub, 1.5–2.5 m. high, with smooth dark reddish-brown bark and hoary tomentose branchlets; leaf-blades ovate to suborbicular, mostly 25–35 mm. long, obtuse



or rounded and more or less prominently apiculate at the apex, firm-coriaceous, finely tomentose when young, becoming glabrous and bright-green; flowers in few-branched panicles, or rarely in simple racemes; branches of inflorescence and bracts tomentose; bracts broadly triangular, acute, 3–4 mm. long, the upper half thin and more or less deciduous; pedicels 5–7 mm. long, glabrous; calyx-lobes ovate, glabrous; fruit ovoid, 10–15 mm. long, chestnut-brown, the granular pulp thin; nutlets united into a solid 5-celled ellipsoid stone, prominently ribbed and rugosely roughened in the intervals.

TYPE LOCALITY: Tehachapi Mountains, four miles west of Kern Station, California.

DISTRIBUTION: Southern Sierra Nevada to the San Gabriel Mountains, California.

#### 8. *Uva-ursi Manzanita* (Parry) Abrams.

*Arctostaphylos Manzanita* Parry, Bull. Calif. Acad. 2: 491. 1887.

*Arctostaphylos elegans* Jepson, Erythea 1: 15. 1893.

An erect bushy or arborescent shrub, 2–4 m. high, with dark reddish-brown bark and puberulent or rarely nearly glabrous branchlets; leaf-blades ovate to suborbicular or obovate, 25–45 mm. long, obtuse or rounded and mucronate at the apex, firm-coriaceous, dull-green with a bloom, somewhat puberulent when young, becoming glabrous; flowers in more or less ample panicles; branches of the inflorescence hoary-tomentose to nearly glabrous; calyx-lobes broadly ovate, glabrous; corolla 7–8 mm. long, pale-pink to white; ovary glabrous; fruit more or less depressed-globose, 8–12 mm. broad; nutlets irregularly coalescent, carinate on the back and rugose.

TYPE LOCALITY: Foothills of the coast ranges north of San Francisco, California.

DISTRIBUTION: Southern Oregon, and southward through the foothills of the coast ranges and the Sierra Nevada to central California.

#### 9. *Uva-ursi patula* (Greene) Abrams, Bull. N. Y. Bot. Gard.

6: 433. 1910.

*Arctostaphylos patula* Greene, Pittonia 2: 171. 1891.

*Arctostaphylos pungens platyphylla* A. Gray, Syn. Fl. N. Am. 2<sup>1</sup>: 28. 1878.

*Arctostaphylos platyphylla* Kuntze, Rev. Gen. 385. 1891.

*Arctostaphylos obtusifolia* Piper, Bull. Torrey Club 29: 642. 1902.

An erect bushy shrub, with rigid crooked branches, 1–2 m. high; bark smooth on the old branches and trunks, not exfoliating, bright reddish-brown; branchlets glabrous, resinous-glandular or glandular-pubescent; leaf-blades ovate to suborbicular, 30–45 mm. long, obtuse or rounded at the apex, firm-coriaceous, bright yellowish-green, not at all glaucous, glabrous or somewhat resinous-glandular toward the base, often reflexed; petioles 10–15 mm. long, glandular-puberulent or glandular-pubescent; flowers in more or less ample corymbose panicles; branches of the inflorescence and bracts resinous-glandular or commonly glandular-pubescent; bracts broadly triangular at the base, abruptly subulate or sometimes acute, 3–7 mm. long, firm and widely spreading or reflexed in fruit, glabrous; pedicels 5–7 mm. long in fruit, glabrous; calyx-lobes broadly ovate, glabrous; corolla 6.5–7.5 mm. long, white tinged with pink; ovary glabrous; fruit chestnut-brown, depressed-globose, 7–10 mm. broad; nutlets irregularly coalescent, rounded on the back and inconspicuously ribbed, otherwise nearly smooth.

TYPE LOCALITY: Pine woods at middle elevations in the Sierra Nevada, California.

DISTRIBUTION: Blue Mountains and the Cascade Mountains, Oregon, to Utah and the San Jacinto Mountains, southern California. Restricted to the coniferous forest region.

ILLUSTRATION: Hall, Yosemite Fl. 181.

#### 10. *Uva-ursi Stanfordiana* (Parry) Abrams.

*Arctostaphylos Stanfordiana* Parry, Bull. Calif. Acad. 2: 493. 1887.

An erect branching shrub, with slender branches and smooth reddish-brown bark, and slender glabrous or sparsely puberulent branchlets; leaf-blades narrowly ovate to oblanceolate, 25–40 mm. long, obtuse to acute and mucronate at the apex, bright-green, glabrous and shining; petioles flattened, 6–8 mm. long; flowers in loose drooping panicles; branches of the inflorescence glabrous or sparsely puberulent, very slender, the flower-bearing part often 4–5 cm. long; bracts subulate, mostly less than 2 mm. long; calyx-lobes ovate, glabrous; corolla pink, 6–8 mm. long; ovary glabrous; fruit yellowish-brown, somewhat depressed-globose;



nutlets broader than long, usually 2 or more coalescent or rarely all united into an irregular stone.

TYPE LOCALITY: Mountain slopes in the vicinity of Calistoga, California.

DISTRIBUTION: Coast ranges of northern and central California, from Mendocino County to Contra Costa County.

ILLUSTRATIONS: *Erythea* 7: *pl.* 3.

### 11. *Uva-ursi insularis* (Greene) Abrams.

*Arctostaphylos insularis* Greene; Parry, Bull. Calif. Acad. 2: 494. 1887.

A symmetrically branched shrub, 1–2 m. high, with smooth reddish-brown bark and pale-green glabrous or sparsely glandular-pubescent branchlets; leaf-blades ovate, mostly 3–4 cm. long, narrowed at base to the petioles, glabrous, bright-green and shining on both surfaces; flowers in open panicles; bracts short, triangular or those near the base of the panicle foliaceous, glabrous; pedicels glandular hairy; fruit smooth, light-brown, slightly depressed, 6–8 mm. broad; nutlets irregularly coalescent.

TYPE LOCALITY: Santa Cruz Island, off the coast of southern California.

DISTRIBUTION: Santa Cruz Island.

### 12. *Uva-ursi tomentosa* (Pursh) Abrams, Bull. N. Y. Bot. Gard. 6: 433. 1910.

*Arbutus tomentosa* Pursh, Fl. Am. Sept. 1: 282. 1814.

*Arbutus tomentosa hispida* Hook. Fl. Bor. Am. 2: 36. 1834.

*Arbutus tomentosa nuda* Hook. Fl. Bor. Am. 2: 36. 1834.

*Arctostaphylos tomentosa* Lindl. Bot. Reg. 21: *pl.* 1791. 1836.

*Arctostaphylos tomentosa hispida* Lindl. Bot. Reg. 21: under *pl.* 1791. 1836.

*Arctostaphylos tomentosa nuda* Lindl. Bot. Reg. 21: under *pl.* 1791. 1836.

*Arctostaphylos cordifolia* Lindl. Bot. Reg. 21: under *pl.* 1791. 1836.

*Andromeda bracteosa* DC. Prodr. 7: 607. 1839.

*Andromeda bracteosa trichoclada* DC. Prodr. 7: 607. 1839.

*Andromeda bracteosa hebeclada* DC. Prodr. 7: 607. 1839.

*Xerobotrys cordifolius* Nutt. Trans. Am. Phil. Soc. II. 8: 268. 1843.

*Xerobotrys tomentosus* Nutt. Trans. Am. Phil. Soc. II. 8: 267. 1843.

*Daphnidostaphylis tomentosa* Klotzsch, Linnaea 24: 79. 1851.

*Daphnidostaphylis cordifolia* Klotzsch, Linnaea 24: 81. 1851.

*Arctostaphylos media* Greene, Pittonia 2: 171. 1891.

*Arctostaphylos glandulosa* Eastw. Proc. Calif. Acad. III. 1: 82. 1897.

*Arctostaphylos canescens* Eastw. Proc. Calif. Acad. III. 1: 84. 1897.

*Arctostaphylos intermedia* Greene; Howell, Fl. NW. Am. 1: 415. 1901. (Misprint for *A. media*.)

*Arctostaphylos hispidula* Howell, Fl. NW. Am. 1: 415. 1901.

*Arctostaphylos oblongifolia* Howell, Fl. NW. Am. 1: 416. 1901.

*Arctostaphylos parvifolia* Howell, Fl. NW. Am. 1: 416. 1901.

*Arctostaphylos intricata* Howell, Fl. NW. Am. 1: 416. 1901.

*Arctostaphylos cinerea* Howell, Fl. NW. Am. 1: 416. 1901.

*Arctostaphylos bracteata* Howell, Fl. NW. Am. 1: 417. 1901.

*Arctostaphylos stigosa* Howell, Fl. NW. Am. 1: 417. 1901.

*Arctostaphylos virgata* Eastw. in Sarg. Trees & Shrubs 1: 203. 1905.

An erect branching shrub, forming a low compact rounded bush a meter or more high, or sometimes arborescent and 3–4 m. high; bark smooth, bright or dark reddish-brown; young branchlets more or less tomentose and often setose-hispid or glandular-villous; leaf-blades petioled, broadly ovate to oblong-lanceolate, mostly more than 25 mm. long, varying from rather dark-green and nearly glabrous to densely canescent or glandular-pubescent at least toward the base; flowers in open or crowded panicles; bracts usually more or less foliaceous, often longer than the pedicels, persistent; pedicels variously pubescent or sometimes glabrate; calyx-lobes ovate to orbicular, nearly or quite glabrous, more or less ciliate on the margins; corolla white to rose-colored, 6–7 mm. long; filaments densely bearded at the base to nearly glabrous; ovary densely tomentose and more or less glandular to almost naked; fruit depressed-globose, 6–8 mm. broad, light yellowish-brown to deep chestnut-brown, glabrous, more or less tomentose or glandular; nutlets irregularly coalescent, acutely carinate.

TYPE LOCALITY: Northwest coast of America.

DISTRIBUTION: Southern British Columbia to northern Lower California; most abundant and variable in the coast ranges of California.

ILLUSTRATIONS: Bot. Mag. 3320; Bot. Reg. 21: *pl.* 1791; Hook. Fl. Bor. Am. *pl.* 130; Sarg. Trees & Shrubs *pl.* 96; M. E. Parsons, Wild Fl. Calif. 13.

13. *Uva-ursi vestita* (Eastw.) Abrams.

*Arctostaphylos vestita* Eastw. in Sarg. Trees & Shrubs 1: 205. 1905.

An erect divaricately branching shrub, 1 m. or more high, with the bark on the old branches and trunks brown, shreddy, and persistent; branchlets tomentose; leaf-blades oblong, ovate, or elliptic, obtuse or acute and apiculate at the apex, cordate to obtuse at the base, 25–40 mm. long, thin-coriaceous, bright-green and sparsely tomentose on the upper surface, hoary-tomentose on the lower; petioles 3–4 mm. long, tomentose; branches of the ample panicles densely tomentose; bracts toward the base of the panicle more or less foliaceous, 8–12 mm. long, those subtending the pedicels lanceolate, acuminate, firm and persistent, 5–7 mm. long, densely tomentose; pedicels stout, tomentose, equaling or exceeding the bracts; calyx-lobes broadly ovate, ciliate on the margins, more or less revolute; corolla pink, 7–8 mm. long; ovary densely tomentose; fruit light-brown, depressed-globose; nutlets irregularly coalescent.

TYPE LOCALITY: Monterey, California, on the sandy plain between Hotel del Monte and the seashore.

DISTRIBUTION: Vicinity of Monterey, California.

ILLUSTRATION: Sarg. Trees & Shrubs pl. 97.

14. *Uva-ursi Andersonii* (A. Gray) Abrams.

*Arctostaphylos Andersonii* A. Gray, Proc. Am. Acad. 11: 83. 1876.

An arborescent shrub, usually 3–4 m. high, with erect branches, smooth rather dark reddish-brown bark, and densely setose-hispid and glandular-villous branchlets; leaves crowded, the blades often 4–6 cm. long, ovate-oblong, acute or obtuse at the apex, sessile or nearly so and clasping at the base, nearly glabrous above and shining, more or less tomentose below; flowers in ample panicles; branches of the inflorescence, bracts, and pedicels densely glandular-villous; bracts more or less foliaceous; corolla 6–7 mm. long, white tinged with pink; ovary densely hairy and more or less glandular; fruit becoming nearly smooth, depressed-globose, 6–8 mm. broad; nutlets irregularly coalescent.

TYPE LOCALITY: Mountain slopes near Santa Cruz, California.

DISTRIBUTION: Santa Cruz Mountains, California.

15. *Uva-ursi auriculata* (Eastw.) Abrams.

*Arctostaphylos auriculata* Eastw. Bull. Torrey Club 32: 202. 1905.

A shrub 1–1.5 m. high, with erect branches, smooth dark reddish-brown bark, and glaucous branchlets clothed with whitish tomentum interspersed with long whitish hairs; leaf-blades oblong to ovate, obtuse or acute and mucronate at the apex, nearly or quite sessile and strongly auriculate at the base, crowded and overlapping on the branches, tomentose; flowers in close drooping panicles; bracts linear, sessile, acute or obtuse at the apex, about 1 cm. long; calyx-lobes orbicular, ciliate on the margins, otherwise glabrous; corolla rose-colored, 6–7 mm. long; ovary densely covered with spreading hairs; fruit depressed globose, light-brown.

TYPE LOCALITY: Mt. Diablo, California.

DISTRIBUTION: Vicinity of Mt. Diablo.

16. *Uva-ursi pechoensis* (Dudley) Abrams.

*Arctostaphylos pechoensis* Dudley, in herb.

A low shrub about 1 m. high or less, with smooth dark reddish-brown bark, and pale finely tomentose branchlets; leaf-blades ovate to ovate-oblong, acute and mucronate at the apex, strongly auriculate and clasping at the nearly or quite sessile base, pale, firm-coriaceous, prominently netted-veined on the lower surface, finely and sparsely tomentose; flowers in congested panicles; bracts broadly lanceolate, 8–12 mm. long, finely tomentose and somewhat viscid; pedicels nearly or quite smooth, 1 cm. long in fruit; calyx-lobes broadly ovate, ciliate on the margins, otherwise glabrous; corolla 6–7 mm. long, white tinged with pink; ovary sparsely hairy toward the summit; fruit depressed-globose; nutlets irregularly coalescent, thin and acutely carinate on the back.

Type collected at the head of Wild Cherry Canyon, Pecho Mountains, San Luis Obispo County, California, April 5, 1902, W. R. Dudley (Dudley Herb. of Stanford Univ.).

DISTRIBUTION: Outer coast ranges, San Luis Obispo County, California.



17. *Uva-ursi viscida* (Parry) Abrams.

*Arctostaphylos viscida* Parry, Bull. Calif. Acad. 2: 492. 1887.

*Arctostaphylos pulchella* Howell, Fl. NW. Am. 1: 416. 1901.

An erect branching shrub forming a rounded compact bush, 2–4 m. high, with dark reddish-brown smooth bark and pale glaucous-green glabrous or rarely somewhat tomentose branchlets; leaf-blades suborbicular to oblong, usually ovate, 25–40 mm. long, rounded to acutish and apiculate at the apex, cordate to acute at the base, very pale glaucous-green and glabrous, firm-coriaceous; petioles 8–12 mm. long; branches of the open panicles glabrous; bracts triangular-acuminate, 2–3 mm. long, glabrous, the tip more or less deciduous; pedicels very slender, 10–12 mm. long, villous-glandular and viscid; calyx-lobes ovate, the thin margins revolute, more or less ciliate; corolla light-pink, broadly urceolate, 7–9 mm. long; ovary glabrous; fruit depressed-globose, 6–8 mm. broad, light-brown; nutlets 4 or 5, 1 or 2 broad and 2–3-celled, carinate and roughened on the back.

TYPE LOCALITY: The middle foothills of the Sierra Nevada, from central California to the Oregon line.

DISTRIBUTION: Southern Oregon to the foothills of the northern coast ranges and the southern Sierra Nevada, California.

ILLUSTRATIONS: Sierra Club Bull. 3: 305, f. 2.

18. *Uva-ursi Mariposa* (Dudley) Abrams.

*Arctostaphylos Mariposa* Dudley; Eastw. Fl. Kings Riv. 52. 1902.

An erect compactly branched shrub, about 2 m. high, with a smooth dark reddish-brown bark and pale glandular-villous or glandular-pubescent branchlets; leaf-blades suborbicular to narrowly ovate, 25–40 mm. long, rounded to acute and more or less mucronate at the apex, cordate to obtuse at the base, entire or rarely serrulate, firm-coriaceous, very pale grayish-green, scabrous, otherwise glabrous or glandular-villous on the margins at the base; petioles slightly angled, 6–10 mm. long, glandular-villous or glandular-pubescent; bracts broadly triangular, about 3 mm. long, pale-brown, acuminate or acute; pedicels glandular-villous, very slender, 6–8 mm. long; calyx-lobes narrowly ovate, 2 mm. long, very thin, ciliate on the margins; corolla 7–8 mm. long; ovary glandular-pubescent; nutlets irregularly coalescent, commonly 3 solitary and 2 united, sharply angled and carinate on the back, apiculate at both ends.

TYPE LOCALITY: Millwood and Kings River Cañon, southern Sierra Nevada, California.

DISTRIBUTION: Common through the foothills and lower altitudes of the forest belt of the Sierra Nevada, California.

19. *Uva-ursi Pringlei* (Parry) Abrams.

*Arctostaphylos Pringlei* Parry, Bull. Calif. Acad. 2: 494. 1887.

An erect shrub 2 m. high, with smooth dull reddish-brown bark and glandular-villous branchlets; leaf-blades narrowly ovate to narrowly elliptic, 25–40 mm. long, obtuse to acute and mucronate at the apex, firm-coriaceous, pale grayish-green, scabrous, more or less glandular-villous at the base, the midvein prominent; petioles glandular-villous, 6–8 mm. long; flowers in ample loose panicles; branches of the inflorescence slender, glandular-villous; bracts membranous, pink, deciduous, 5–6 mm. long; pedicels very slender, 12–16 mm. long, glandular-villous; calyx-lobes thin, glandular-villous, oblong-lanceolate, 3 mm. long; corolla pale-pink, 7–8 mm. long; fruit glandular, globose, light-brown; nutlets irregularly coalescent, sharply carinate and coarsely rugose in the intervals.

TYPE LOCALITY: Rincon Mountains, altitude 2000 m., Arizona.

DISTRIBUTION: Coniferous forest belt, Arizona.

20. *Uva-ursi drupacea* (Parry) Abrams, Bull. N. Y. Bot. Gard.  
6: 434. 1910.

*Arctostaphylos Pringlei drupacea* Parry, Bull. Calif. Acad. 2: 495. 1887.

An erect compactly branched shrub, 1.5–2 m. high, with smooth dull reddish-brown bark and densely glandular-villous branchlets; leaf-blades broadly ovate to narrowly obovate,

rounded, obtuse, or acutish and mucronate at the apex, obtuse or cordate at the base, 25–40 mm. long, firm-coriaceous, pale grayish-green, scabrous, more or less glandular-villous at the base and on the margins, the midvein prominent; petioles glandular-villous; bracts membranous, deciduous, pinkish, 5–6 mm. long, glandular-villous; pedicels very slender, 10–15 mm. long, glandular-villous; calyx-lobes glandular-villous, lanceolate, 3 mm. long; corolla 7–8 mm. long; fruit glandular-pubescent, ovoid; nutlets united into an ellipsoid stone, carinate, ribbed and rugose in the intervals, sharply pointed at both ends.

TYPE LOCALITY: Cuyamaca Mountains, San Diego County, California.

DISTRIBUTION: Coniferous forest belt, from the San Bernardino Mountains, California, to northern Lower California.

### 21. *Uva-ursi pumila* (Nutt.) Abrams.

*Arctostaphylos pumila* Nutt. Trans. Am. Phil. Soc. II. 8: 267. 1843.

*Daphnidostaphylis pumila* Klotzsch, Linnaea 24: 267. 1851.

A low spreading shrub forming mats, with assurgent branches, reddish-brown exfoliating bark, and slightly glandular branchlets canescent with a fine soft tomentum; leaves numerous, the blades narrowly obovate to spatulate, rarely elliptic or ovate, 1–2 cm. long, rounded to acute and inconspicuously mucronate at the apex, acute or sometimes obtuse at the base, dull-green above, distinctly paler beneath, tomentose when young or often permanently so on the lower surface; petioles 2–3 mm. long; flowers in short congested simple or few-branched racemes with tomentose peduncles and bracts, the latter lanceolate-acuminate, 2–4 mm. long, firm and persistent; pedicels 3 mm. long, slender, more or less glandular-pubescent; calyx-lobes broadly ovate, ciliate on the margins; corolla pink, 4 mm. long; ovary pubescent; fruit light-brown, nearly glabrous, slightly depressed-globose; nutlets readily separable or rarely irregularly coalescent, carinate, otherwise smooth.

TYPE LOCALITY: Monterey, California.

DISTRIBUTION: Confined to the Monterey peninsula, California.

### 22. *Uva-ursi nummularia* (A. Gray) Abrams.

*Arctostaphylos nummularia* A. Gray, Proc. Am. Acad. 7: 366. 1868.

A low erect shrub, 5–15 dm. high, with numerous and very leafy branches, dark reddish-brown exfoliating bark, and glandular-pubescent and more or less setose-hispid branchlets; leaf-blades nearly orbicular to obovate or oblong-lanceolate, entire or rarely irregularly serrate, acutish to rounded and mucronate at the apex, acute to shallowly cordate at the base, 7–20 mm. long, thin, dark-green and shining above, paler beneath, cartilaginous and revolute on the margins, glabrous or the midvein puberulent toward the base, and the margins sometimes sparsely setose-hispid; petioles 3–4 mm. long, glandular-pubescent and setose-hispid; flowers in short terminal panicles or racemes; bracts triangular at the base, abruptly tapering into a subulate more or less deciduous apex, 2–3 mm. long; pedicels slender, 5 mm. long in flower, glabrous; calyx-lobes ovate, 3 mm. long, ciliate or glabrous on the margins; corolla 5 mm. long or less; ovary densely pubescent; fruit deep-brown, nearly or quite smooth, oblong, flattened laterally, 4–6 mm. long; pericarp thin with very little dry granular pulp; nutlets 2–4, readily separable, thin-walled.

TYPE LOCALITY: On the plains near Mendocino City, California.

DISTRIBUTION: Coast ranges of California, from Mendocino County to Monterey County.

### 23. *Uva-ursi myrtifolia* (Parry) Abrams.

*Arctostaphylos myrtifolia* Parry, Pittonia 1: 34. 1887.

An erect shrub, branching from the base, 3–10 dm. high, with smooth dark reddish-brown bark and setose-hispid branchlets; leaf-blades ovate to narrowly elliptic, 1–2 cm. long, obtuse or commonly acute and prominently cuspidate at the apex, firm-coriaceous, bright-green and glabrous on both surfaces or ciliate when young, the margins not revolute, prominently reticulate-veined; flowers in short simple or few-branched racemes; rachis glandular-pubescent; bracts lanceolate, 2 mm. long, persistent, spreading or reflexed; pedicels glabrous, 2–3 mm. long, with prominent and persistent scarious bracteoles at the base; calyx-lobes



broadly ovate, often pubescent on the margins toward the base; corolla 4 mm. long; ovary covered with short stiff hairs; fruit smooth, brown, small; nutlets 3 or 4, scarcely 2 mm. long.

TYPE LOCALITY: On the summit and slopes of gravelly ridges, east of Ione, Amador County, California.

DISTRIBUTION: Known only from the type locality.

24. *Uva-ursi glauca* (Lindl.) Abrams, Bull. N. Y. Bot. Gard.  
6: 433. 1910.

*Arctostaphylos glauca* Lindl. Bot. Reg. 21: under *pl. 1791*. 1836.

*Xerobotrys glaucus* Nutt. Trans. Am. Phil. Soc. II. 8: 268. 1843.

*Daphnidostaphylis glauca* Klotzsch, Linnaea 24: 80. 1851.

An arborescent shrub or small tree, with a trunk sometimes 3 dm. in diameter; branches compact and rigid, the bark smooth, reddish-brown; branchlets pale-green and glaucous, glabrous or rarely glandular-pubescent; leaf-blades oblong, elliptic, or commonly ovate, obtuse and more or less mucronate at the apex, obtuse to shallowly cordate at the base, 2–4 cm. long, entire or on vigorous shoots serrate, very pale-green and glaucous on both surfaces, glabrous or rarely glandular-pubescent on the margins toward the base; petioles 7–10 mm. long, glabrous or rarely glandular-pubescent, twisted giving the leaves a vertical position; flowers in short terminal panicles or racemes; branches of the inflorescence glabrous or rarely glandular-pubescent; lower bracts foliaceous, those subtending the flowers 3–6 mm. long, triangular, spreading or recurved, firm; pedicels glabrous or rarely glandular-pubescent; calyx-lobes broadly ovate, 4 mm. long, ciliate or naked on the margins; corolla 8–9 mm. long, white tinged with pink; ovary glandular; fruit ovoid, 12–15 mm. broad, light-brown, very viscid; pericarp thin and wrinkled, without granular pulp; nutlets united into a solid smooth stone, apiculate at both ends, the union of the nutlets marked by longitudinal lines.

TYPE LOCALITY: California.

DISTRIBUTION: Mt. Diablo in the coast ranges and the foothills of the Sierra Nevada southward to San Diego County, California; the glandular-pubescent form is in the Santa Inez Mountains.

41. *ORNITHOSTAPHYLOS* Small, gen. nov.

Shrubs with erect, stiff, much-branched stems. Leaves opposite, sometimes whorled, numerous, persistent; blades narrow, thick, entire, revolute, very short-petioled. Flowers numerous in axillary and terminal branching panicles with slender rachis and pedicels, the bracts and bractlets minute. Calyx persistent; lobes broad, about as long as the tube, spreading or somewhat reflexed at maturity. Corolla globular-urceolate; lobes 5, or rarely 4, short, broad, spreading or recurved. Stamens 10, or rarely 8, included; filaments dilated near the base, unappendaged, pubescent; anthers broad, mostly oval, each sac with a curved awn. Ovary 5-celled or rarely 4-celled, depressed, seated on a thick disk, puberulent; style columnar; stigma minute. Drupe dry, with a smooth thin pericarp and very thin pulp, the nutlets 2-celled by a partition from the inner angle.

Type species, *Arctostaphylos oppositifolia* Parry.

1. *Ornithostaphylos oppositifolia* (Parry) Small.

*Arctostaphylos oppositifolia* Parry, Proc. Davenport Acad. 4: 36. 1884.

A shrub densely branched above, with puberulent twigs; leaf-blades linear or nearly so, usually narrowly linear, 2.5–8 cm. long, acute or mucronate, entire, deep-green, glabrous and shining above, white or whitish and more or less tomentulose beneath, narrowed into a very short petiole; panicles partly drooping, the slender branches minutely pubescent; calyx about 2.5 mm. wide, the lobes deltoid, acute or acutish, glabrous or nearly so; corolla 3–3.5 mm. long, the lobes obtuse; stamens about 2 mm. long; filaments villous; anthers glabrous, the awns as long or nearly as long as the sacs; drupes globose or slightly depressed, 4–6 mm. long.

TYPE LOCALITY: Lower California, within 20 miles of the United States boundary line.

DISTRIBUTION: Northern Lower California.

## 42. ARCTOUS (A. Gray) Niedzu. Bot. Jahrb. 11: 144. 1889.

*Arctostaphylos* § *Arctous* A. Gray, Syn. Fl. N. Am. 2<sup>1</sup>: 27. 1878.

Shrubs with depressed or prostrate branches. Leaves alternate, mostly clustered near the ends of the branches, deciduous; blades broadened upward, veiny, toothed, sometimes obscurely so, narrowed into long petioles. Flowers few together in clusters from terminal scaly buds, appearing before or with the leaves, not drooping. Calyx persistent; lobes 4 or 5, broad, as long as the tube or somewhat longer than the tube. Corolla white, pink, or yellowish, urceolate; lobes 4 or 5, very small, recurved or spreading from the constricted mouth. Stamens 8 or 10, included; filaments relatively long, dilated at the base; anthers short, each sac with a very slender dorsal awn. Ovary 4- or 5-celled, depressed; style columnar; stigma minute. Drupe somewhat nodding, globular, seated on the calyx, colored.

Type species, *Arbutus alpina* L.

Corolla-lobes copiously ciliate; drupe black or purple-black.  
Corolla-lobes entire or obscurely erose; drupe red.

1. *A. alpina*.
2. *A. erythrocarpa*.

### 1. *Arctous alpina* (L.) Niedzu. Bot. Jahrb. 11: 141. 1890.

*Arbutus alpina* L. Sp. Pl. 395. 1753.

*Mairania alpina* Desv. Jour. Bot. Desv. II. 1: 37. 1813.

*Arctostaphylos alpina* Spreng. Syst. 2: 287. 1825.

Plants with depressed, tufted, or matted branches, the twigs glabrous or nearly so; leaf-blades spatulate to obovate-spatulate, 1–3 cm. long, obtuse or acutish, finely serrate, reticulate-rugose, often ciliate, especially on the more or less elongate petiole; calyx 3–3.5 mm. wide, the lobes deltoid, acute; corolla white, broadly urceolate, 3.5–4.5 mm. long, the lobes long-ciliate; drupes black or purple-black, 6–10 mm. in diameter.

TYPE LOCALITY: Lapland.

DISTRIBUTION: Greenland and Labrador to Newfoundland and Quebec, and on the high mountains of New England; also in Europe and Asia.

ILLUSTRATIONS: Fl. Dan. *pl.* 73; Lightf. Fl. Scot. 1: *pl.* 11; Sv. Bot. *pl.* 487; Engl. Bot. 29: *pl.* 2030; Sturm, Fl. Deuts. 13: *pl.* 51; Britt. & Brown, Ill. Fl. f. 2777; ed. 2. f. 3250.

### 2. *Arctous erythrocarpa* Small, sp. nov.

? *Arctostaphylos rubra* Fernald, Rhodora 16: 32. 1914.

Plants similar to *A. alpina* in habit, but with usually larger, relatively broader and brighter-green leaf-blades; calyx about 3 mm. wide, the lobes deltoid, acute; corolla white or pink, becoming yellowish, narrow-urceolate, 5.5–6.5 mm. long, the lobes entire or obscurely erose; drupes bright-red, 9–13 mm. in diameter.

Type collected on Sulphur mountain, near Banff, Alberta, Canada, *W. C. McCalla 2158* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Manitoba to Alaska and British Columbia.









## PARTS OF VOLUMES PREVIOUSLY PUBLISHED

- 3<sup>1</sup>: 1-88. Hypocreales: Nectriaceae, Hypocreaceae. Fimetariales: Chaetomiaceae, Fimetariaceae.
- 7<sup>1</sup>: 1-82. Ustilaginales: Ustilaginaceae, Tilletiaceae.
- 7<sup>2</sup>: 83-160. Uredinales: Coleosporiaceae, Uredinaceae, Aecidiaceae (pars).
- 7<sup>3</sup>: 161-268. (Uredinales:) Aecidiaceae (pars).
- 9<sup>1</sup>: 1-72. (Agaricales:) Polyporaceae (pars).
- 9<sup>2</sup>: 73-132. (Agaricales:) Polyporaceae (conclusio).
- 9<sup>3</sup>: 133-200. (Agaricales:) Boletaceae, Agaricaceae (pars).
- 10<sup>1</sup>: 1-76. (Agaricales:) Agaricaceae (pars).
- 15<sup>1</sup>: 1-75. Sphagnales: Sphagnaceae. Andreaeales: Andreaeaceae. Bryales: Archidiaceae, Bruchiaceae, Ditrichaceae, Bryoxyphiaceae, Seligeriaceae.
- 15<sup>2</sup>: 77-166. (Bryales:) Dicranaceae, Leucobryaceae.
- 16<sup>1</sup>: 1-88. Ophioglossales: Ophioglossaceae. Marattiales: Marattiaceae. Filicales: Osmundaceae, Ceratopteridaceae, Schizaeaceae, Gleicheniaceae, Cyatheaceae (pars).
- 17<sup>1</sup>: 1-98. Pandanales: Typhaceae, Sparganiaceae. Naiadales: Zannichelliaceae, Zosteraceae, Cymodoceaceae, Naiadaceae, Lilaeaceae. Alismales: Scheuchzeriaceae, Alismaceae, Butomaceae. Hydrocharitales: Elodeaceae, Hydrocharitaceae. Poales: Poaceae (pars).
- 17<sup>2</sup>: 99-196. (Poales:) Poaceae (pars).
- 22<sup>1</sup>: 1-80. Rosales: Podostemonaceae, Crassulaceae, Penthoraceae, Parnassiaceae.
- 22<sup>2</sup>: 81-192. (Rosales:) Saxifragaceae, Hydrangeaceae, Cunoniaceae, Iteaceae, Pterostemonaceae, Hamamelidaceae, Altingiaceae, Phyllonomaceae.
- 22<sup>3</sup>: 193-292. (Rosales:) Grossulariaceae, Platanaceae, Crossosomataceae, Connaraceae, Calycanthaceae, Rosaceae (pars).
- 22<sup>4</sup>: 293-388. (Rosales:) Rosaceae (pars).
- 22<sup>5</sup>: 389-480. (Rosales:) Rosaceae (pars).
- 25<sup>1</sup>: 1-88. Geraniales: Geraniaceae, Oxalidaceae, Erythroxylaceae, Linaceae.
- 25<sup>2</sup>: 89-171. (Geraniales:) Tropaeolaceae, Balsaminaceae, Limnanthaceae, Koeberliniaceae, Zygophyllaceae, Malpighiaceae.
- 25<sup>3</sup>: 173-261. (Geraniales:) Rutaceae, Surianaceae, Simaroubaceae, Burseraceae.



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THE NEW ERA PRINTING COMPANY  
LANCASTER, PA.